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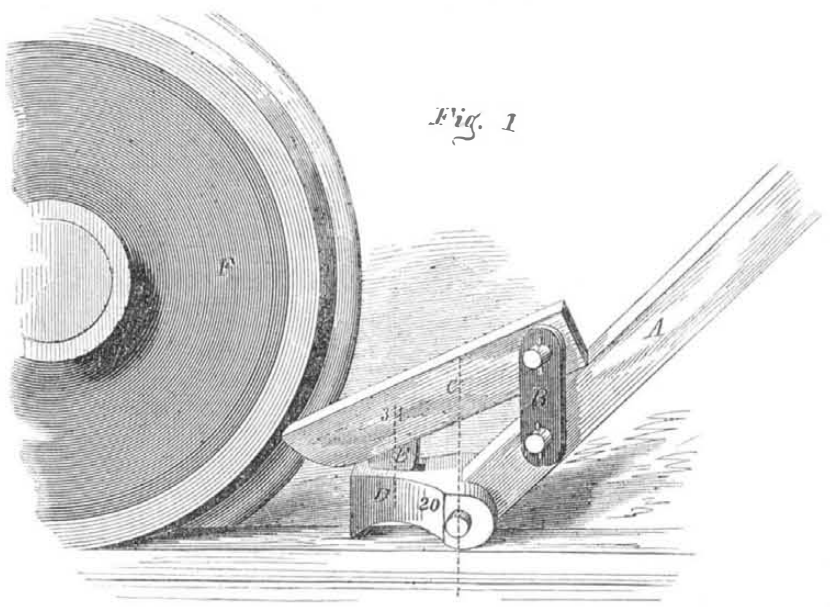
COLES' PINCH BAR.



Improvement in Pinch Bars.

This figure is a side elevation of an improved pinch bar or duplicate lever, applied to moving a locomotive on the track—F simply represents the wheel of the locomotive.

The nature of the improvement consists in making a portable and powerful duplicate lever for the easy and convenient moving of heavy bodies, and consists in providing a long and a short lever, A and C, the latter above the inner end of the former, and the two united together by a strap, B, on each side, working on pivots, and the long lever secured to a rest block or bolster, and working in it on an axis pin, the short lever, C, having a fulcrum block E, resting in a recess made in the top of the rest block, D. This machine is so represented that its construction and application will be easily understood by all. The power to lift is applied at the end of the long lever, A. The action of the power is very economical, inasmuch as the fulcrum of the common lever,—which is generally a simple block or stone laid upon the ground—has a tendency to slide back, thus diminishing the effect. The rest block, D, in this machine counteracts this slipping action, as the end of the long lever, A, acts in a line opposite to that of the weight, thus making the two forces balance one another, always producing a firm rest or fulcrum for the action of the lifting lever, without which little effect can be produced. Archimedes knew the value of a firm fulcrum, the boast being attributed to him, that if he had a place whereon to rest his lever he could lift the earth. The power of a lever is calculated by the difference of space through which the point passes that is applied to raise the weight, and that at which the power is applied, in a given time. The lever, C, is of the first order, as the fulcrum is placed between the weight and the power; the lever, A, is of the second order, as the weight comes between the fulcrum and the power. Whatever is gained in power by the combination of levers, is always lost in time, but it is of great advantage to gain power at the expense of time for many purposes. The gain in this composite pinch-bar over the common single straight bar, in reference to power, is as 34 to 20. This bar is designed for the use of railroads in assisting to lift the wheels of locomotives when off the track, and when it is considered that a firm fulcrum for action is the grand desideratum, (no fulcrum, no lever,) the value of the bolster rest block, D, in this combination, will be duly appreciated.

Measures have been taken to secure a patent. More information may be obtained by letter addressed to David B. Cole, Piermont, N. Y., sole assignee of the inventor, Isaac J. Cole.

Burning Mountains of the Moon.

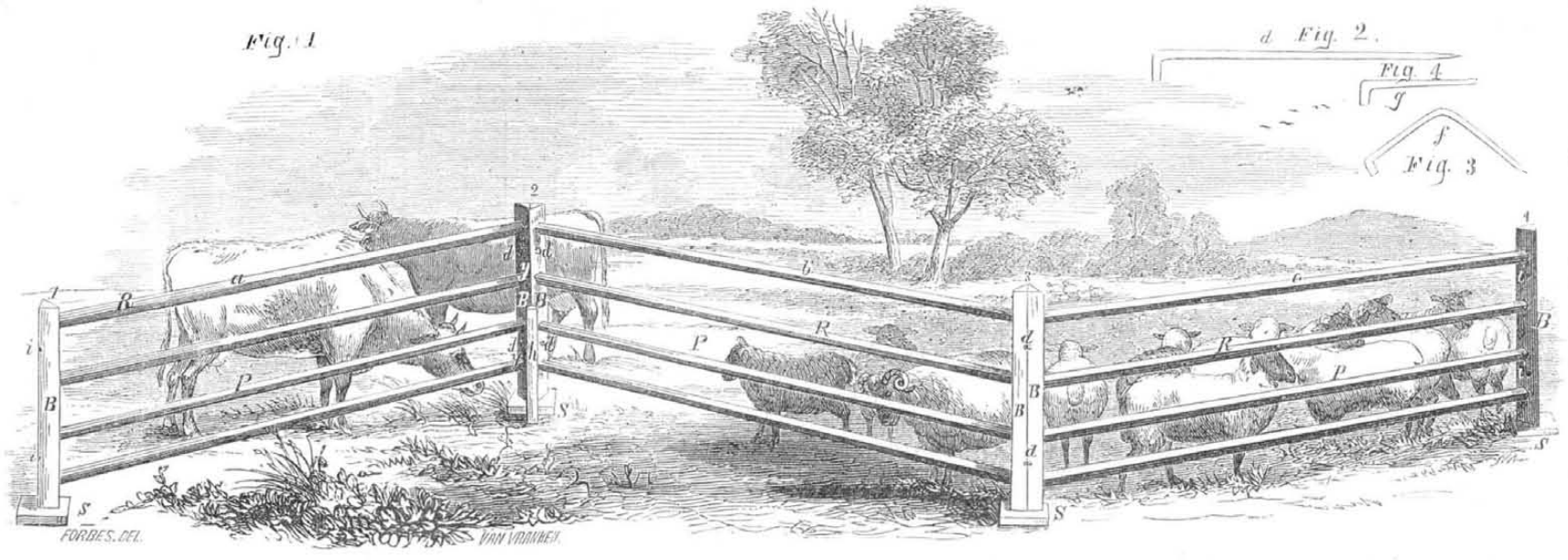
MESSRS. EDITORS—Will you inform a constant reader of your valuable paper, how the combustion in the volcanoes of the moon is probably supported without an atmosphere.

Yours, F. S.

Philadelphia, Pa., Nov. 4, 1854.

[If the materials of which the moon is composed consisted of great quantities of oxygen, carbon, and hydrogen, they would burn easily, independent of an atmosphere like ours. It is not supposed that the fires of volcanoes are of the same character as the combustion of coals in a stove or grate, but the bursting of a great heated mass through a cold crust. Volcanoes in our planet are not dependent for combustion on our atmosphere, as molten lava has been thrown up from the bottom of the sea, and there are a number of islands in various parts of the world which appear to be of volcanic origin. It may yet be discovered that the moon has a low atmosphere, or a very attenuated one, perhaps of hydrogen gas. Some now suspect there is water in the moon; if so, in all likelihood there is an atmosphere of some kind. The question, however, is still an open one, and full of interest for the philosopher.

PRINDLE'S NEW FIELD FENCE.



The annexed figures represent an improvement in field fences, for which a patent was granted to D. R. Prindle, on the 25th of April last, and is now, for the first time, brought prominently before the public.

Figure 1 is a perspective view of the fence embracing three panels and posts from 1 to 4 inclusive. Fig. 2 is a view of one of the metal spikes which unites the panels. Fig. 3 is a view of fig. 2, embracing the form it assumes when the panels have been united and set in position; and fig. 4 is a view of wedge which is employed to secure the metal connection.

The nature of the invention consists in the mode of fastening together the adjacent posts or standards of a field fence, by passing a piece of metal having a head on one end through two adjacent posts, and securing the same by a wedge, or its equivalent, at the other end, the posts being so beveled as to cause any desired angle to be made by the separate panels. P represents the panels of the fence, each formed of beveled posts or standards, B, connected in any suitable manner with rails, R. These panels are joined together by the metal connections, *d*, formed as shown in fig. 2; the two panels being placed in the prolongation of each other, and the metal connection, as shown in fig. 2, passed through auger holes, *i*, in the posts, B, in the direction of the rails, R. After thus joining the panels, they are moved so as to assume any desired angle with each other, the connections, *d*, bending as shown at *f*, in fig. 3, so as to accommodate themselves to the angle of the panels. The wedges, *g*, are then driven into the auger holes, *i*, securing the metal connections as shown in figure 1. The connections should be made of wrought iron, or any metal that will readily bend; there should be at least two connections between each pair of panels though as many may be added as may be deemed expedient. Between each pair of panels may be stretched a wire for adding to the stiffness of the fence. The posts may be made of split logs, the convex surfaces being placed in contact, the panels united, and the required angle given, as above described. In exposed situations, the posts or standards, B, may rest upon stones, S, and be connected therewith by metal pins, inserted in the stone and bottoms of the posts.

This fence was exhibited at the New York State Agricultural Fair held in this city in October last, and was awarded the Diploma of the Society. It may be constructed of any suitable material, such as rails, boards, poles, &c., or wires may be used for the rails, R. It is made in panels, and can be constructed in-doors during winter, and put up in the spring.

This fence can be put up, taken down, and removed from one place to another in a very short time. It is portable, convenient, and easily made. More information may be obtained by letter addressed to the patentee, at East Bethany, Genesee Co., N. Y.

Discount on Indiana Money.

Owing to the exorbitant rates charged by our Wall Street Brokers for discounting bills on most of the Indiana banks, we are compelled to announce that at present we must refuse taking them.

Thompson's last *Reporter* quotes Indiana money at from 30 to 50 per cent. discount, which is too great a premium for us to pay on remittances before getting the amount into available funds.

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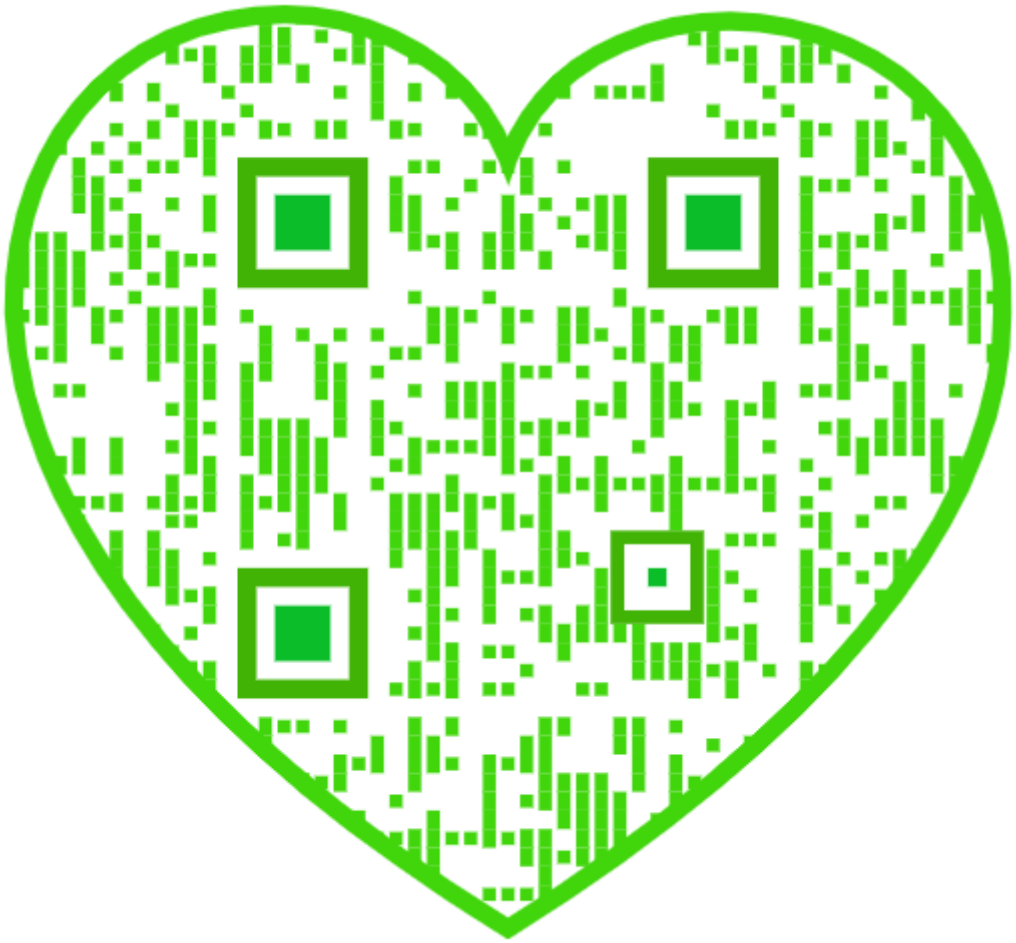

Spontaneous Combustion of Coal.

A correspondent (J. S. Newberry) of the Cleveland (Ohio) *Herald*, gives an account of the spontaneous combustion of a heap of bituminous coal, belonging to Messrs. Younglove and Hoyt, at their paper mill in that city, and of which he was a witness. About 25,000 bushels of Chippeway bituminous coal was piled up on planks in their yard, exposed to the weather. Under no apprehensions of spontaneous combustion, the proprietors of the coal were surprised when informed by their engineer that it was on fire, and that steam was rising from it. On examination they found it even so. The heap was sensibly hot on all sides, and a plank lying on the top so hot as to be painful to the hand applied to it, and on digging to the bottom they found a portion of the coal fully ignited, and which blazed up brightly on the admission of air. They immediately turned a copious stream of water on the top of the heap to extinguish the fire. Next day Mr. Newberry visited the heap, and found the fire partially extinguished by the water, but apparently through all the interior, a stratum of coal from one to two feet thick, lying next the planking, was perfectly coked, and some of it still ignited. The planking was completely charred. He says, "The fire was, in this case, unquestionably due to spontaneous combustion, as the exterior of the heap on all sides was composed of coal which had suffered no change, but was found as fresh and as bright as when mined; only the interior and most inaccessible portion of the pile was ignited. The combustion was without doubt excited by the decomposition of the bi-sulphuret of iron—that is, the change of the sulphuret into the sulphate (copperas) by the absorption of oxygen.

This instance of spontaneous combustion in our bituminous coal, will suggest to those in the coal trade, and to consumers, the propriety of at least keeping in mind the fact that coal *may* spontaneously ignite, and that large heaps of small coal should not be permitted to be for months undisturbed, nor be placed in combustible receptacles, or in such relations to combustible matter that spontaneous combustion, if it should happen to occur, would be productive of disastrous consequences."

Irrigation of Land.

H. G. Bulkley, of Kalamanzoo, Mich., details some interesting experiments in the *Genessee Farmer*, in relation to the abovenamed subject. He says, "I have a piece of ground of about two acres, on which I have been making some experiments the past season, having a stream of water from a spring passing through it. I plowed the grouud (which was sod) in May last, into lands ten to twelve feet wide, and four furrows deep, by throwing each successive furrow on the top of the last, thus placing the sod at the bottom and the mellow dirt on the top, and breaking it up near twenty inches deep. By the way, I think much of this mode of subsoiling, mine was all done with one pair of small horses. The dead furrows, or ditches, between the different lands, were cleaned out with the hoe, and were filled with water at such intervals as it has been found necessary during the summer months for the purpose of irrigation. The water was not permitted to overflow or run off, but settled into the soil, and supplied the plants by capillary attraction.

The result has been very satisfactory. All kinds of roots are surprisingly large and beautiful; and notwithstanding the season has been so dry that nearly all the gardens in the town have been ruined with the drouth, as well as many trees killed, still there are beets on these beds that will measure over two feet in circumference, and nearly as long, with carrots, parsnips, and other vegetables in proportion.

One square bed of strawberries. set in hills eighteen inches apart, and transplanted about the middle of May last, produced more than half a bushel of berries that we kept an account of, besides what were eaten from the vines and destroyed by the birds. Some of the berries measured three and a half inches in circumference.

From one bed that contained nine square rods, or one-eighteenth of an acre, have been sold about sixty dollars worth of vegetables during the summer. Besides, the *quality* of the vegetables has not been inferior to the quantity. Vegetables grown quickly, and without being retarded by drouth, are healthy and palatable."

Patent Case.

India Rubber Again—A Decision—In the last number of the Scientific American we presented the merits of the suit between Horace H. Day, and the New England Car Spring Co., before Judge Betts, in the U. S., Circuit Court in this city, and related how it was put off for further action until the next Spring term. We also hinted that it might be some years yet before litigation would cease between the parties. But since our last number was issued, a decision in reference to a suit between the same plaintiff but other defendants, relating to the same patent, has been made by Judge Pitman, of Providence, R. I., which will have a powerful influence in all other suits. The suit-at-law was held in the U. S. Circuit Court at the last June Term, but the decision of Judge Pitman was only placed on file on the 4th inst., in consequence of pleadings to demurrers.

The complainant was Horace H. Day, the defendants, Isaac Hartshorn and other manufacturers of india rubber goods. The action was instituted for damages for the infringement of the extended patent of Edwin M. Chaffee, of Providence, Day claiming the patent by assignment from Chaffee, and the defendants setting up several pleas against the plaintiff's right of action, alleging that they had a license from Charles Goodyear and from William Judson, under authority from contracts made by them (Goodyear and Judson,) with Chaffee, before he sold his patent to Day. To these pleas the plaintiff's counsel filed demurrers, which were argued in Providence on the 21st, 22nd, and 23rd days of Sept. last, before Judge Pitman, by N. Richardson of New York, and A. Jencks of Providence, for Day, and by Chas. O'Connor of New York, and Saml. Ames of Providence, for the defendants, together with J. T. Brady, and other counsel for defendants. There was therefore quite an array of legal talent displayed in the pleadings, and little Rody has the honor of making the first decision on this important and elastic subject. The *special* plea set forth for the defendants was the license granted to them as stated, by Goodyear and Judson, but Judge Pitman decided that neither Judson nor Goodyear had any anthority to grant them license; upon every plea judgment was given for the plaintiff. Victory this time has perched upon the banner of Day, who now can shout with good will *vive la Caoutchouc.*

A New Solvent for Collodion.

MM. E. Mathew Plessy and Iwan Schlumberger have proposed wood spirit, or methylic alcohol, as a substitute for ether for dissolving collodion. For this purpose it has many advantages; as it is not so volatile as ether, a thicker and more uniform coat can be applied on glass for photographic purposes. The solution of collodion thus prepared is capable of dissolving a much larger quantity of iodide of potassium than an etherial solution, and will consequently yield a more sensitive coating. The only inconvenience attending the use of wood spirit, and which it is important to notice, is, that during its slow evaporation from the surface of glass, &c., a certain quantity of formic acid is produced. By adding a little alcohol of sp. gr. 40° to the wood spirit and gently warming the glass plate upon which the coating is to be put, the formation of the acid may be obviated. The low price of wood spirit will, we are sure, induce many photographers to test the matter.—[Bulletin de la Société Industrielle de Mulhouse.

Granaries for the Storing of Corn, by the Brothers Huart, of Cambrai.

The Messrs. Huart, the great millers of Cambrai, have patented a peculiar kind of granary which they have in use for the storing of their corn. In this arrangement the corn fills completely the space in which it is to be preserved, and is kept in constant motion by means of a steam engine. The grain is lifted up and stirred round by means of a helix, and from thence falls upon an apparatus which, by means of a fan, the chaff dust and other foreign substances are removed, and the insects and their larvæ destroyed. The corn is then carried back to the same inclosed space again, and the operation from time to time repeated. These granaries are considered to be adapted not only for the preservation of corn in good condition, but for that which is already damaged.—[Le Génie Industriel, France.

Inhabitants in the Stars.

The last number of *Blackwood* discusses this question with great ability, dealing tremendous right hand blows to those philosophers who have speculated so much and so inconclusively on this subject. The venerable Sir David Brewster, who has so warmly espoused the side of the question which supposes the stars to be inhabited, as being "the hope of the Christian," receives a respectful but severe criticism. Sir David has certainly some very singular notions respecting the stars being inhabited, and in his answer to Dr. Whewell, who has written a work to prove that the earth alone of all the planets is inhabited, asks, "is it necessary that an immortal soul should be hung upon a skeleton of bone; must it see with two eyes, and hear with two ears, and touch with ten fingers, and rest on a duality of limbs? May it not rest in a Polyphemus with one eye ball, or in an Argus with a hundred. May it not reign in the giant forms of the Titans, and direct the hundred hands of Briareus. The being of another world may have his home in subterranean cities warmed by central fires, or in crystal caves cooled by ocean tides, or he may float with the nereids upon the deep; or mount upon wings as eagles;—or rise upon the pinions of the dove, that he may flee away and be at rest." The venerable Scotch philosopher is more speculative and eloquent, than argumentative and orthodox. Supposing it were true that immortal souls were in the stars, and dwelt in beings mounting on eag es wings, what has that to do with the hope of the Christian? Or supposing all the planets to be devoid of life, what has that to do with the hope of the Christian? Nothing at all. This system of speculating in the physical sciences, independent of any solid proofs one way or the other, and dragging in religion into such controversies, neither honors the Author of religion, nor adds a single laurel to the chaplet of the sciences. An immortal soul in a dove would not make that bird human; nor will we ever be able to tell whether Mars or Jupiter contain a single living object.

The Philadelphia Water Works Ornamental Pipe.

Our readers will remember the illustration of the ornamental stand pipe of the West Philadelphia Water Works, which was published on page 61 Scientific American, and stated to be designed by Wm. H. Howson, of Camden, N, J. We have received a letter from Messrs. Birkinbine & Trotter, Engineers and Contractors of said Water Works, in which they state that Mr. Howson did not design the stand pipe, but that it was designed and erected by them, Mr. Howson being in their employ as draughtsman for a portion of the time the works were in the progress of erection. We would state that we have read affidavits certifying that Mr. Howson was the designer of the ornamental stand pipe in question, and that such evidence was, and is still satisfactory to us, respecting the author of the design in dispute.

Sugar for Cholera.

Dr. Mackintosh recommends, in the London *Lancet*, the use of sugar in the treatment of cholera, and asserts that under its use, in thirteen cases of collapse, nine recovered. He gives it as follows:—Two ounces of refined sugar are dissolved in six ounces of camphor mixture, with a few drops of rectified spirits. One table spoonful was given every ten minutes. Wine was also generally given in frequent quantities, and beef tea.

Gale's Straw Cutter.

In the description of the Straw Cutter of Warren Gale, of No. 4 NorthMarket st., Boston, which was illustrated by an engraving on page 60, we forgot to mention that each machine has a fly wheel, but we did not place one on the figure, as the object was to show its excellent cutting principle, and arrangement of the parts claimed in the patent. Mr. Gale's straw cutters are as well constructed as they are excellent in the feeding and cutting principle. In the flange, the piece of hide rests on a bar of iron behind it, and t is set forward by means of set screws through the cylinder, which press against the bar of iron. The screw bolts that hold the piece of hide to the flange, pass through behind the bar. This we did not particularly describe, because we considered (and do so now,) that the description given along with the engraving would enable every person to see the merits of the machine.

Interesting Patent Case.

In the U. S. Circuit Court, Philadelphia, Thursday the 8th inst., before Judges Grier and Kane, a very interesting patent case was decided in reference to a patent for making Lampblack. The parties were Richard S. Child, complainant; Thos. Adams and others, defendants. The application was for an injunction to restrain the defendants from an alleged infringement of the plaintiff's patent right for making lampblack, it had been before the court for a number of days, and was so intricate that some days were required in making the decision. It was in substance as follows:—The Court held that the original patent of 1844, which issued to Gilbert Minni, was invalid, because the applicant did not comply with the conditions of the patent act in stating truly "of what country he was a citizen"—and that the reissued patent of 1852 is equally invalid, the Commissioner of Patents having no power to grant such a patent to act by way of confirmation of the original; nor to grant a new original eight years after the invention has been in public use, which will give a valid title to such patentees. The complainant's bill was therefore dismissed with costs.

Restoring to Life.

"The scientific men of France are at present speculating on a recent instance of a young man being brought to life after being frozen eleven months on the Alps. The blood of a living man was infused into the veins of the frozen youth, and he moved and spoke. The experiment was afterwards tried on a hare frozen for the purpose, with complete success."

[Within the past month, we have seen the above extract in at least a dozen of our cotemporaries; it has been traveling round for the past three years as an item of scientific news, but respecting the truth of which there is not the slightest evidence.

The Butterfly Plant.

The *National Intelligencer* says that a specimen of the singular and beautiful butterfly plant is now in bloom at the National green house in Washington. The blossoms are very large and yellow, with reddish-brown spots, and are moved to and fro with every breath of air, so as to resemble very much the gaudy insect from which it derives its name. The plant was brought from the Island of St. Thomas in the U. S. frigate *Raritan.*

An Old Chronometer.

Captain Cook's chronometer has been presented to the United States Institution by Admiral Sir Thomas Herbert. It has undergone some adventures; after two voyages with Cook, Lieut. Bligh took it out in the *Bounty*; the mutineers carried it to Pitcairn's Island, where it was sold to an American, who sold it again in Chili; finally Sir Thomas Herbert bought it at Valparaiso, for fifty guineas.

We are able to furnish all the back numbers of the present volume of the Scientific American, and to new subscribers we shall continue to send the back numbers as long as we have them, so as to render their volumes complete.

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(For the Scientific American.)

The Elements of Agriculture, by Geo. E. Waring, Jr.

I have read this elementary work on agriculture with much interest. A work of the proper character is a great desideratum, much as this may deserve commendation.

There are in these elements many mistakes, and some false statements: one case, on p. 37, "Window glass is silicate of potash, rendered insoluble by additions of arsenic and litharge." No authority for this can be found in standard writers. Silicate of potash, or of soda, are soluble in water when the potash is in large proportion, and certainly not when the silica is in larger proportion.

"We must give them (plants) every thing that they require, or they *will not grow at all*," p. 41. Poor wheat has been pointed out because it had not enough of phosphate of lime, but the plants grew, however, though not so perfectly.

But the great change in the "Elements" should be in stating the inorganic substances *as they are* in plants, and not by their components. There is no sulphuric acid, as such, in plants, nor phosphoric acid, nor potash, nor soda, nor lime, &c., but the substanccs in plants are gypsum (sulphate of lime,) phosphate of lime, carbonates of potash, of soda, of lime, &c. It is just as proper to speak of potassium and sodium in plants, as of potash and soda; and of phosphorus as of phosphoric acid, and so on, while there is no proof of the existence of phosphorus as pure, even in suds, or of phosphoric acid, &c., but all of them are in some chemical combination. Now it is the chemical combinations that the farmer needs to know. Hence it is that the analysis of soils has so little practical value. The agriculturist cannot tell, unless he is an expert chemist,what compound is most needed. Often, indeed, the expert chemist can not put together the results of analysis of soils, so as to take up the whole of the elements given, and make consistent chemical compounds.

The same difficulty lies in the practical benefit of many analyses of manures. Take that of horse manure, p. 273. What is the 10·49 of phosphoric acid combined with, for there is not the least proof that phosphoric acid alone has value, or the 1·89 of sulphuric acid, or the 0·03 of chlorine, for these alone avail nothing, or the 11·30 of potash, and the 1·98 of soda, and the 1·17 of oxyd of iron, for these are in the same predicament? In like manner, similar analyses of the seeds, leaves, atoms, &c., of plants, can be useful to the farmer only on the most general view that there are such substances in them. When Davy showed the farmer that a fine field of clover contained in the plants about three bushels of gypsum to the acre, the knowledge was at once practical, and any common-sense farmer apprehended the subject and knew what to do, and when Davy showed that gypsum had no influence upon some land, because there was enough of it already in the soil, as shown by analysis, the practical value was obvious. He showed the truth in the compounds existing in the plants, and not by the mere statement of the separate constituents of the compounds. In the one case the farmer has knowledge given him; in the other not even a chemist could easily show the truth.

In the account of "Lime and Salt Mixture," p. 114 to 116, the process is well enough, but the chemical changes in the diagram have no real existence. Chloride of sodium cannot be decomposed by lime or by carbonate of lime either by water or heat. This every chemist knows: there can be no chloride of lime formed in this way. But if there could, the odor of chlorine would be evident, which it never is. Though Mr. Waring in this follows Prof. Mapes, there is no such chemical result, and there can be none. The truth is that common salt enters as common salt into plants, and is a valuable stimulous to plants. Carbonate of potash, gypsum, phosphate of lime, all operate in the same way, and not by their elements. All this show of chemistry for agriculture is ridiculous, and makes all such efforts repulsive to the educated chemist

In his forthcoming and greater work, it is hoped Mr. Waring will freely use his pen in altering much, and in adding real chemistry trustworthy to all he has yet published.

TRUTH.

Protection against Hail.

The second volume of the works of Arago have called attention to several points in Meteorology, among which is the subject of hail and the means of protecting fields from this evil. In the chapter which he devotes to this important subject, he states that in 1847, two small agricultural districts of Bourgogne had lost by hail crops to the value of a million and a half francs. Certain of the proprietors from the neighborhood went to consult Arago on the means of protecting them from like disasters. Resting on the hypothesis of the electric origin of the hail, he suggested the discharge of the electricity of the clouds by balloons communicating by a metallic wire with the soil, as mentioned in a preceding number of this Journal (Jan. 1853, p. 111.) These projects, however, were not carried out; and in view of the doubts as to the electric origin of hail, he proposed to investigate the subject anew. He had not the time to bring out any results; but he persisted in believing in the effectiveness of the method proposed. Another subject is discussed in this volume. Arago inquires whether the firing of cannon can dissipate storms. He cites several cases in its favor, and others which seem to oppose it; but he concludes by recommending it to his successors. Whilst Arago was propounding these questions, a man not conversant in science, the poet Mery, was collecting facts supporting the view;—and since the publication of the second volume of Arago's work, he has been led to give his results to the public. In a remarkable pamphlet entitled "Paris futur," he concludes strongly on the efficaciousness of the firing of cannon in dissipating storms, and mentions numerous observations in support of it. He says that his attention was called to the subject in 1828, while an assistant at the "Ecole de tir" of Vincennes. Having observed that there was never any rain on the morning of the exercise of firing, he was led to examine the annals of military and revolutionary science, and he found there, as he says, facts which justified the expressions which became common, such as "Le soleil d'Austerliz," "Le soleil de Juillet," upon the morning of the revolution of July, and he concluded by proposing to construct around Paris 12 towers of great hight, which he calls "tours imbrifuges," (imbrifugal towers,) each carrying 100 cannons, which should be discharged into the air on the approach of a storm. Although this pamphlet was the offspring of a man of imagination instead of a scientific man, it has attracted attention, giving occasion to some interesting discussion, of which report says, the *pro* and the *con* were sustained with equal success; this was at the commencement of the present month (August;) to-day the subject is forgotten; and why has it deserved to pass so soon into oblivion? It was in consequence of a negative fact. The 14th of August was a fine day. On the 15th, the *fete* of the Empire, the sun shone out, the cannon thundered all day long, fire-works and illuminations were blazing from 9 o'clock in the evening. Everything conspired to verify the hypothesis of M. Mery, and chase away storms for a long time. But towards 11 in the evening a torrent of rain burst upon Paris, in spite of the pretended influence of the discharge of cannon, and gave an occasion for the mobile Gallic mind to turn its attention in other directions.—[Paris Correspondence of Silliman's Journal.

[We have always entertained the opinion that the firing of cannon, by disturbing the equilibrium of the atmosphere, tended to create storms, and perhaps upon the same principle of reasoning, may so affect a disturbed state of the atmosphere, as to produce quietude and dissipate storms. From all the evidence which we have collected, however, we are of the opinion that long continued and heavy discharges of artillery create storms of rain; it was so at the battle of Waterloo.

Artesian Wells in Michigan.

An inquiry in a recent number of the SCIENTIFIC AMERICAN about artesian wells, induces me to send you the following description of some of these phenomena, as they occur in Monroe County, in this State. The whole of that section is destitute of springs, except those of sulphurous water, which are quite numerous along the streams and lake shores; indeed I do not know of a spring of pure water in the county, yet water of excellent quality is found just below the surface—ordinarily about 20 feet. A year ago, the drouth being severe, some of these wells began to fail, and a resident on the banks of Stony Creek determined to sink his lower.—After some hours laborious digging in a hard pan, on which all pursuit of water had heretofore ended, the pick suddenly broke through and the water burst up with such violence as to compel him to leave the tool in the fissure and hasten out to save himself from drowning. It has been a flowing fountain ever since, of unchanging volume and unvarying temperature (55°.) Since then many have dug and bored through this stratum, and always with the same result. The depth is remarkably uniform, and the clearness of the water is almost incredible, objects at twenty-four feet appearing as well defined as if viewed through air only. The water is impregnated with iron, and has everywhere the same mineral quality, comes from the same depth and flows to the same hight. Fish different from any known in the country often appear in these wells.

The soil is a deep sandy loam, superimposed on a bed of argillo calcine varying in thickness with the elevation. Underlying this is a stratum of silicious lime rock.

Monroe was settled at the same time as Detroit, one of the oldest towns in the Union, and it seems singular that no one discovered this subterranean lake sooner, it lay so near the surface, in some places but ten or twelve feet; but still more singular that no natural springs are formed by it.

Not far from these wells, in a basin surrounded by sand-dikes rising abruptly from the plain, is a bed of the before mentioned rock, so finely comminuted by some natural agent as to drift in the wind when laid bare of the soil. Some years since, before the road that crosses it was raised by an embankment, the wear of travel had denuded the rock, and the pure, brilliant white sand had spread over a large surface, imitating, in the faint moonlight, a sheet of water, deluding the traveler into the notion that a lake obstructed his path. People residing near it were sometimes called up in the night by strangers, to give directions about getting around the *pond*. This beautiful silex is the best of glass material, and the wonder is that no manufactory has been established there. The bed is inexhaustible, and fuel is abundant.

The geological foundation of the whole surface of the State inclines me to believe that this rock subtends the entire peninsula, and is always accompanied with water at a certain depth. It rarely crops out, but where that happens, it bears unmistakable signs of its former aqueous bed. G W. BOWLSBY.

Hudson, Michigan, 1854.

Stame and Steam.

For highly interesting information with regard to this subject, we beg leave to call your attention to a report of a committee appointed by the Maryland Institute to conduct experiments on the heating power of steam, it reports that stame at 333° will not boil a cistern of water any quicker than ordinary steam at 222°, and that combined steam at a much lower temperature than the stame, and at nearly one-tenth less pressure on the boiler, performed the same work in forty per cent. less time, thus clearly demonstrating that a power is created by the combination which is not possessed by either steam or stame singly.

WETHERED, Brothers.

Baltimore, Md., November, 1854.

[The experiments referred to by our correspondent are beyond our philosophy. We cannot conceive how such results could have been obtained.—Ed.

Irving's Safety Circulating Steam Boiler.

Having constant inquiry in regard to the superiority of the above boiler, its capacity, economy, etc., we have been induced to copy the following article from the Buffalo *Express*, as an answer to some who have solicited information, and many who no doubt feel an interest in its success:—Ed. SCI. AM.

From the Buffalo Express.

"As a matter of public interest we publish the subjoined letter to one of our enterprising manufacturers, in reference to an invention which is justly exciting considerable attention. If economy, durability, and safety are recommendations, it would seem that this boiler is worthy the examination of all interested. We learn that one of the boilers will soon be in operation in this city:—

KALAMAZOO, Mich., Aug. 31, 1854.

DEAR SIR:—Your favor of the 28th inst., propounding a series of inquiries relative to the 'Irving Steam Boiler,' is received,—which I proceed to answer in order, viz:—

1. What size (diameter and hight) is your boiler? Ans.—3 feet 6 inches diameter, and 7 feet high.

2. What horse power will it give? Ans.—12 horse power.

3. How much hard wood do you use per day of 10 hours? Ans.—Less than half a cord.

4. Is the boiler liable to get out of order? Ans.—It is not—have used ours 14 months without repairs—now in perfect order.

5. Is it easily repaired if out of order? Ans.—Yes, as easy as ordinary boilers.

6. Do you consider it an economical boiler as to fuel? Ans.—I do.

7. Do you recommend it in preference to any other boiler you are acquainted with?—Ans.—I do.

You give the size of your cylinder (diameter and length of stroke) and a schedule of machinery you drive with it, and make the inquiry, viz:—

Do you suppose your boiler large enough for my mill? In answer I would say not. I would for your use recommend a boiler not less than 4 feet 6 inches diameter, and eight feet high. I note for further inquiries in your postscript, viz:—

Is the boiler easily cleaned out? Ans.—It is.

Can bituminous coal be used without filling up the flues? Ans,—I am not able to say, never having used it, but should not apprehend any difficulty.

I have briefly replied to your several inquiries, as I have found them, by a practical use of the boiler we have had in use for the last 14 months, and I hope they will be understood; if not, advise, and further explanations will be cheerfully given.

In practical use, I have found the Irving Boiler to exceed my expectations. Still, were I to get another, I would have the steam chamber more capacious. In relation to cleaning our boiler, I will explain our method, viz:—After running the day, I open the blow-off cocks (two in number, one from each coil of water pipes) and blow the water off, so that no water will escape from the try cocks. This is all we do, and though we use hard water strongly impregnated with lime, we have never found a particle of scale or crust in the boiler. In the first use of the boiler, I feared incrustation, and every week for two months I opened and examined it; but being perfectly satisfied that I had nothing to fear, I let it remain for ten months,—when I had a most thorough and searching examination, and found the boiler in as good order as it was when I commenced using it. I certainly would not exchange it for any boiler I have ever seen or used.

For these reasons it requires less care in use, and a saving of more than half the fuel to obtain the same power. The engine I use is the size of yours. We drive with it four iron lathes, one iron plane, one drilling machine, one bolt cutter, one large (1200 lbs.) grindstone, one Aerostatic fan blower for our foundry. This blower makes two thousand revolutions per minute.

I am, very respectfully yours,

W. BURT.

Jno. T. Noye."

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New Inventions.

Fulgham's Sawing Machinery.

The annexed figure is a side elevation (with the side piece of the frame removed) of an improvement in sawing machinery, for which a patent was granted to Benjamin Fulgham, on the 19th of September last. The nature of the improvement consists in placing a saw within a carriage attached to a jointed frame, so arranged as to cause the saw to traverse over the stick of timber to be cut, and perform its work, the log or stick remaining stationary.

A is the frame which supports the working parts, B B are ways (one only shown) parallel to each other—one on each side. A carriage, C, works between these ways, and has a circular saw, D, hung within it. This carriage is secured to the lower end of the frame, E, the upper end of said frame being attached to one end of a frame, F, hung on shaft, G, which passes through the center of the frame, A, and has a driving pulley, H, on it. The two frames, E F, are connected together by a shaft, I, with its end fitting loosely in the frames, and with two pulleys. *b c*, upon it, the pulley *b* has a belt, *d*, passing around it and around the pulley, H. The pulley *c* has a belt, *e*, passing around it, and a pulley, *f*, on the saw arbor, J. There is a counterpoise, K, on one end of the frame, F. Through each side of the carriage, C, there passes a lever, *g*, (one shown) these levers have friction rollers, *h h*, at their lower ends, and they are made to bear upon the lower sides of the ways by the weights, *i*, and they insure a steady motion to the carriage. At the opposite end of the shaft, G, is a pulley, *j*, and there is also one on the opposite end of shaft, L; this shaft has a sliding cylindridal rotating frame upon it, and two loose pulleys, (the one, *l*, alone shown.) N is a transverse shaft underneath L; it has three pulleys firmly secured on it (the one, *n*, only being represented.) There is a belt passing around the off side pulleys on shafts, L and G; a cross belt passes around pulleys, *l n*.—O is a belt attached to the carriage, C, at points, *v*, and passes around a pulley on shaft N, and another, *w*, at the end of the frame. There is a horizontal forked lever on the top of the frame, through which there passes an arm, *q*, with a weight on it. This arm is secured at its lower end to a lever, R, which has its fulcrum at *a*, and a weight, *b'* at one end, while its opposite end works in a serrated spring catch, S. There are two rods, T, T', which work in suitable guides on the upper surface of one of the ways, B,—a rod at each end of the way. At the end of T' a cord, *f*, is attached, which passes around two small pulleys, *g' g'*, and its other end is secured to a small lever, *h'*, which acts against the upper part of the spring catch, S. *c' c'* are projections on the rods, T T'.

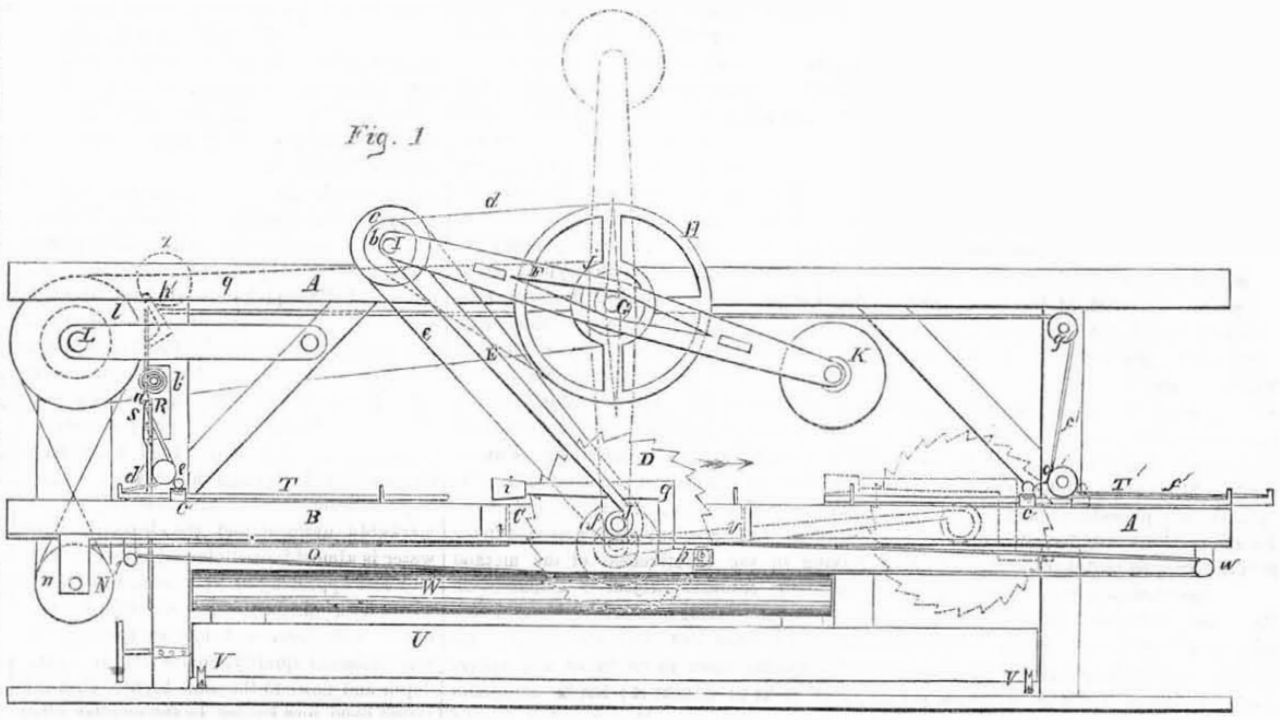
Underneath the frame, A, is a carriage, U, in which is the log, W, to be operated upon. This carriage works upon ways, V V, placed transversely to the frame, A, so that it can be moved from underneath the frame and the log adjusted upon it. Motion is communicated to the shaft in any proper manner, and the saw, D is made to rotate by pulleys, H *b c f*. The carriage is moved along by the two band pulleys, *j*, which communicate motion to the carriage, C, in consequence of the band, O, the ends of which are attached to the carriage, and pass around the pulley on shaft N. The saw, D, as the carriage is moved along, cuts the log its entire length; the frames, E and F, change their positions as the carriage moves, so that the band pulleys, H, *b c f*, are at all times at equal distances from one another, at whatever part of the log the saw may be. The motion of the carriage, C, is changed at the end of the stroke by it (the carriage) striking the projections, *c'*, on the rods, T T'; the rod, T, as it is moved, operating lever, R, and throwing the sliding frame on L, in connection with the loose pulley on its shaft, and causing it to turn with the shaft. When the carriage moves in the direction of the arrow, and when at the end of the log, as shown in dotted lines, the rod, T', is moved by the carriage, and the small lever, *h'*, throws out the spring catch, S, and liberates the lever, R, which falls by means of its weight, *b'*, and then a clutch horizontal shipper on the top (not shown,) throws the sliding frame on L, in contact with the pulley, *l*, and the reverse motion is given to the carriage. The carriage saw frame is thus moved backwards and forwards, self-acting, by dogs and shippers, like a self-acting iron planing machine.

Planes may be employed on the same shaft, and this machine converted into a planer to smooth the surface of planks and boards. A building is not required to be any larger for the operation of this sawing machinery than the length of the frame, whereas, in ordinary machines, it has to be twice that length for a carriage moving the log against the saw. The claim is for sawing timber by placing the saw, D, within a carriage, C, attached to frames, E, F, connected together and operating as described.

More information may be obtained by letter addressed to Mr. Fulgham, Richmond, Wayne Co., Indiana, who will cheerfully afford all the information desired.

IMPROVEMENT IN SAWING MACHINERY.

Fig. 1



TURNING THE LEAVES OF MUSIC BOOKS.

The annexed engravings represent an improvement in apparatus for turning the leaves of books, music ones especially, for which a patent was granted to H. C. Bridgham, of New London, and J. M. Stewart, of Norwich, Conn., on the 12th of Sept. last.

Figure 1 is a front view of the apparatus fastened to a music rack; figure 2 is a view of the under side, and figure 3 is a section showing a portion of the interior. Similar letters refer to like parts.

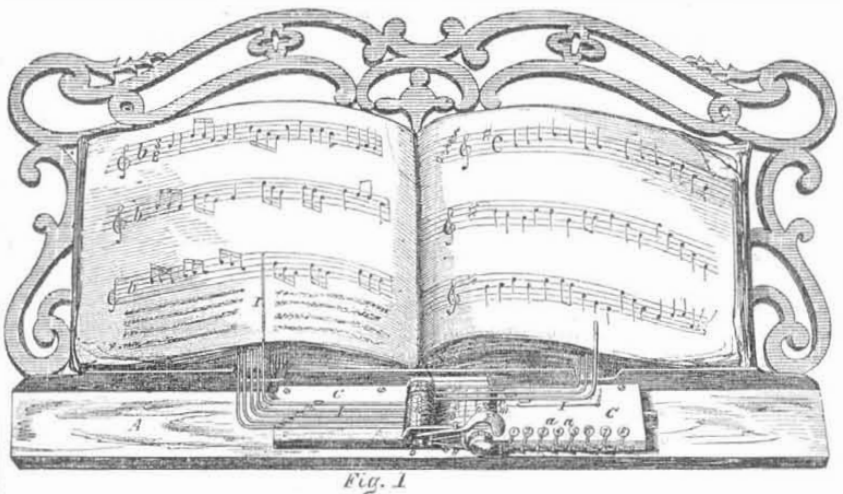


Fig. 1

Fig. 2

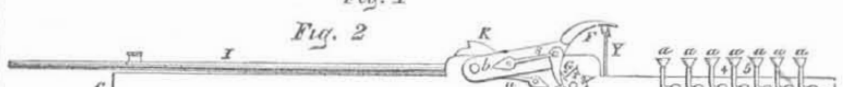
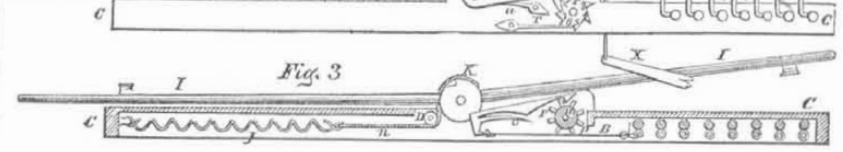


Fig. 3



The nature of this invention consists in applying to an ordinary music rack, certain devices which enable the performer to turn the leaves of the music book by means of a touch of the finger, knee, or foot, in succession, when required. Also in devices to turn the leaves separately when a portion of a tune is repeated; so constructed as not to derange the apparatus which turns the leaves, successively; and lastly, in closing the forks of the fingers which turn the leaves, by means *k*, are fitted so as to turn freely upon it, each of which collars is provided with a finger, I, made in the form represented, and provided with a spring to hold or press the leaf of the book firmly against the finger, so that the leaf will be moved by the finger in either direction. Each of the fingers, I I, is also provided with a knob as represented, numbered from one to eight, inclusive. Each of the collars, *k*, has a groove in its periphery for the cord, *n*, which is fastened in said groove, of a spring, or making one finger of the fork elastic, so as to close and gripe the leaf.

In these figures, C C is the plate or case of an apparatus fastened to the music rack, A A, in fig. 1. To this case, C C, the other parts of the apparatus are affixed or adjusted; the top and bottom of said case being peforated for the pin, *b*, to which pin a series of collars, and passes around the pulley, D, and is fastened to the spring, J, the opposite of which spring is fastened to the end of the case, C. These cords and springs are arranged to turn all the fingers, I I, over to the left, and hold them there, unless they are turned to the opposite side by the operator, when the pawl, O, which is made in the form represented, and provided with a spring is forced into a notch in the collar, *k*, and holds the finger over at the right hand, until the pawl is released by one of the pins, P, in the roller, *m*, which acts against the opposite end of the pawl, and raises it out of the notch, when the spring, J, and cord, *n*, draw the finger over to the left, carrying the leaf with it. The roller, *m*, is provided with a series of pins, P, one for each pawl, and is fastened to its shaft which turns in holes in the side of the case, C, by a ratchet wheel which is acted upon by the pawl, G, fastened to the lever, F, and held in contact with the wheel by the spring, S, fastened to the lever, F, as represented. The lever, F, vibrates on the lower end of the pin, *b*, and is made in the form represented, and connected to the lever, X, by the cord, Y, which cord may pass over pulleys, or through guides, so that the lever, X, may be arranged near the floor, so as to be depressed by the foot of the operator whenever he wishes a leaf turned from right to left; the pins, P, in the roller, *m*, being arranged so as to raise the pawls, O O, in succession when required, and the teeth in the ratchet wheel being made to correspond with the pins in the roller. The detent spring, T, is fastened to the case, C, and acts as a pawl to prevent the ratchet wheel and roller, *m*, from being turned in the wrong direction. We have now described so much of the apparatus as turns the leaves in regular succession.

The performer having played the first six leaves of a tune, and wants to repeat that portion of it which is upon the last three leaves played, he accordingly turns the fingers Nos. 4, 5, and 6, from the left to the right, so that they are caught and held by the pawls, O O, as heretofore described, and proceeds to repeat, and when he wants a leaf turned he depresses a lever, *a*, number 4, and turns the rock shaft to which it is fastened, vibrating the lever connected to the pawl, O, by the link, B, so as to draw the pawl out of the notch in the collar, K, when the spring, J, and cord, *n*, operate the finger, I, No. 4, and turn the leaf from right to left, as heretofore described, and as he proceeds he depresses the next levers, *a a*, numbers 5 and 6, at the proper time, which release the corresponding fingers to turn the leaves as required; and when he has done repeating and proceeds, he depresses the lever, X, at the proper time so as to release finger 7, which turns the leaf for him to proceed, and finish the piece or tune being played. By using the levers, *a a*, in repeating, that part of the apparatus which is used to turn the leaves in succession, remains stationary, and no part of it is deranged by the operation of the apparatus in repeating; so that when the repeated portion is completed, it is ready to be operated, so as to turn the leaves for the remainder of the tune or piece performed. This apparatus possesses advantages over most others.

More information respecting this neat and convenient apparatus may be obtained by letters addressed to Messrs. Bridgham and Stewart, at Norwich, Conn.

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Scientific American.

NEW YORK, NOVEMBER 18, 1854.

Machinery the Power of Nations.

Many entertain the opinion that the number of inhabitants, the climate, the extent of territory, and the natural fruitfulness of soil, are the exponents of a nation's power. If this were so, those nations would be the most powerful which possessed the greatest number of inhabitants, the largest extent of territory, the finest climate, and the richest soil. But do we find this to be true respecting the nations of the earth? No; some of the weakest and most depressed of them, teem with inhabitants, basking under the most serene skies, and walking upon the most extensive and fruitful plains. Look at China, Persia, and some of the Indian Kingdoms, in Asia; all Africa; Spain in Europe, and Brazil in America, for proofs of this opinon. On the other hand, a virtuous, industrious, and ingenious people will make any country great and powerful. Not without natural resources to be sure, but what signifies an abundance of natural resources in any country, unless the people develope and apply them. It is therefore the genius and the industry of the people which constitute the power and the wealth of nations. Take Great Britain at the present moment—because that country presents a prominent example. Its population amounts to about twenty and a half millions, (20,536,357) with only two and seven-tenths of an acre of land for each, a climate by no means genial, and a soil not very productive naturally. It maintains the largest fleets that ever floated on the ocean since the world began, and an army both large and expensive. The annual revenue of the general government amounts in round numbers to about two hundred and fifty million of dollars, involving a tax of more than twelve dollars for each man, woman, and child. Now, if we allow one-fourth of this population—a very fair estimate—as being the actual producers, it stands out in bold relief that 5,134,089, pay $250,000,000 of taxes every year to the general government, besides supporting all the rest of the population, and paying the great county and municipal taxations of the country. Is not this apparently a wonderful and extraordinary thing in the eyes of men? But this small army of workers cannot perform such wonders; they cannot pay such taxes and support such armaments by the labors of their own hands. How then, are all these things done? By machinery; in our day that country which employs the greatest amount of the best machinery in every department of industry, is the most powerful. It was calculated ten years ago that Britain had manufacturing machinery in operation equal to the labor of four hundred millions of men—nearly half the inhabitants of the globe. This is the secret of her power and ability to raise such extraordinary revenues. The genius and industry of her people have developed her natural resources, and small though she be in extent, the roundelay of her drum, beats a morning march round the globe. Our own country is extensive in domain, fruitful in soil, varied in climate, has one-fifth more inhabitants than Britain, and possesses natural resources surpassing those of all other nations. Its commerce floats on every sea, its inhabitants are ingenius, intelligent, and industrious, and its moral and physical power is second to no other nation. But without the great amount of useful machine power which our country possesses—those Briarean hands of iron which spin, weave, sow, reap, forge, grind, saw, plane, and hew—our country would not be powerful, though its inhabitants were twice as numerous, and its natural resources ten fold more abundant. Machinery, then, is the foundation on which rests the physical power of modern nations, and its perfection and multiplicity should be the aim and object of every citizen. New and useful inventions should therefore be fostered and encouraged by all, and inventors amply rewarded for their productions, because they are the sources of national power.

The New Razeeing Process.

The reception of another unwelcome bill of between two and three hundred dollars, presented through us to some half dozen inventors, by the Commissioner of Patents, for alterations of their models, calls our attention once more to the practical working of the new *razeeing* process.

The requirements of the patent law, relative to models, occurs in the act of 1836, section 6, in the following language:—"And he [the inventor] shall, morever, furnish a model of his invention, in all cases which admit of a representation by model, of a convenient size to exhibit advantageously its several parts." In other words, the law says to the inventor, "We will not require you to go to the expense of furnishing a full-sized, working machine, but you may delineate your invention by model, making it on such a scale as you may deem most convenient and advantageous as a display of your improvement." This has been the admitted interpretation of the law by all the Commissioners excepting the present.

Of late years, owing to the rapid accumulation of models and the lack of space for their storage, the Commissioners have been in the habit of *recommending* inventors to bring the dimensions of their models within a cubic foot; no matter what the length, breadth, or depth was, so long as the sum total did not exceed 1728 cubic inches. Very recently, however, Commissioner Mason, with out giving any previous notice, has issued an imperative order for the further curtailment of models, irrespective of the subject of invention or the proportion of parts. He ruled that *no model should be accepted* if it exceeded twelve inches in any of its dimensions.

Owing to the neglect of the Commissioner to give prior notice of this change, or to take proper steps to circulate the intelligence, many models have been and are still being sent to the Patent Office, which transgress the new *ukase*. Under these circumstances the practice of the Office is to notify the inventor that his model is too large; and further, that as it may be inconvenient for him to send for the model in order to reduce it, the Office will undertake the work of alteration on the reception of a given fee.

Thus, for example, George Copeland [see another column] is informed by the Commissioner that, for the sum of one hundred and twenty-five dollars, the Office will engage to produce a model which will exactly suit its ideas of dimensions. As we prepared this case, we know something concerning it.—The model is a loom for weaving seamless bags, and represents a most ingenious invention. The model sent to the Patent Office was a beautiful and costly one, but some of its parts perhaps projected a little above the line of a twelve-inch rule, for which excess the Commissioner proposes to mulct the inventor in $125. The model was completed before the new rule went into operation.

Messrs. Hiller & Allen are to be mulcted in $60. This invention is an improvement in switches, and the fault in their model is that the miniature track is too long.

Mr. Jonathan Pearce, inventor of a rope-making machine is to be mulcted in $75, for the same reason. This name was noticed in a list published a week or two since.

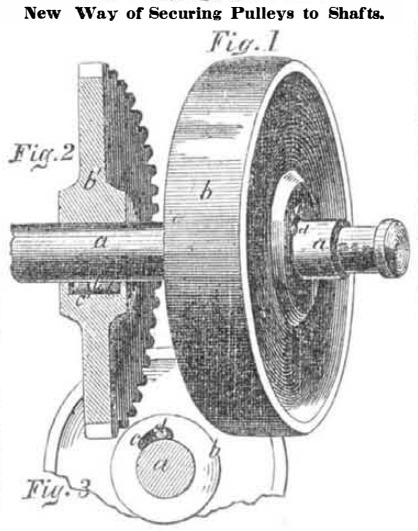
We might go on and fill a whole page with similar instances, in which unwarrantable expenses have been heaped upon poor, toil-worn inventors.

One of the worst features of the whole, is, that these costs are imposed *before* the case is examined by the Patent Office. It frequently happens that after the inventor has been put to great expense in order to make his model a few inches smaller, his case is rejected—the *patent refused*. While we accord to Commissioner Mason all honor for the wise, vigorous, and independent manner in which he has thus far conducted the affairs of the Patent Office, we feel that we should be wanting in duty if we failed to lift our voice against a practice which bears with such needless severity upon a large class of our most useful citizens.

The rule we complain of originates, we doubt not, from a worthy desire on the part of Mr. Mason to economise the space set apart for the reception of models. But we tell him distinctly, that the operations of the rule are having a disheartening effect upon inventors, and that they denounce his practice as an imposition and a robbery.

It seems to us a matter of but very little moment whether a model exceeds by an inch or two, a specified measure. We should think that the Commissioner would prefer to receive such models without objection, rather than increase his already arduous duties by the creation of new correspondence and the hearing of new appeals. The old recommendation regarding the cubical contents is the best. Mr. Mason well knows, and so does every other sensible individual, that owing to the rapid increase in the number of inventions, the system of preserving models must of necessity *soon be abolished*. Why then continue to split hairs on a sinking platform.

New Way of Securing Pulleys to Shafts.



The accompanying engraving illustrates a new and very effective method of securing all kinds of pulleys and wheels to their shafts, for which a patent was granted on the 5th day of September, 1854, to Charles Clarine, an ingenious mechanic of this city.

The invention consists in casting a recess within the bore of the hub, and introducing therein a small roller; one end of the recess is made deeper than the other, so that when the wheel is turned in one direction, the roller will move towards the shallower end of the recess, and bind the shaft and wheel together in the firmest manner possible.

Fig. 1 is a perspective view of a pulley thus attached to a shaft; fig. 2, a semi-perspective sectional view of a cog wheel on the same shaft; fig. 3, a side elevation of a portion of the pulley and shaft united. Similar letters of reference indicate the same parts in all the figures.

a is the shaft, *b* is the pulley, *b'* is the cog wheel, *c* is the cam-shaped cavity, *d* is the roller.

By the use of this improvement, pulleys and wheels of all kinds may be secured to their shafts, without the use of screws, or the labor and expense of cutting seats and preparing keys. They may be also removed entirely, or shifted and adjusted to any other part of the shaft in a moment. In casting the wheel or pulley, a small cavity or recess, *c*, is left on the inside of the hub. One end of this recess is deeper than the other, which gives it a cam shape with reference to the shaft. Into the recess thus formed, a piece of round iron, forming a roller, *d*, of a diameter just equal to the deepest part of the cavity, is dropped, and the wheel shoved upon the shaft. Now, by turning the wheel, the roller, *d*, advances towards the shallower end of its recess, and consequently causes the wheel and shaft firmly to bind. By reversing the wheel, the roller returns to the deeper end of the recess, and the wheel may be again removed. The average expense of attaching wheels and pulleys of about eighteen inches or two feet diameter, to shafts, by keys in the ordinary manner, is estimated at about one dollar, irrespective of key seating machines. The expense of such attachments by the use of the present improvement is only the cost of the roller, *d*, a mere nothing. Besides this, the superlative convenience of Mr. Clarini's method will be apparent at a glance. The inventor believes that manufacturers of cotton machinery, and all other kinds of mechanism where large numbers of wheels and pulleys are employed, will be able to effect important savings by the adoption of this improvement.

Further information may be had by addressing the inventor, at No. 438½ Broadway, New York.

Special Notice to Inventors.

We have been officially informed by the Commissioner of Patents, that models belonging to the inventors named below, will not be accepted. The owners thereof are required either to furnish new models or pay the sums opposite their names, to enable the Office to bring their original models into proper dimensions and condition.

Those who prefer to have the Office do the work, are requested to remit their respective dues to us at once, without further notice, and we will see that the money is properly applied.

Those who intend to send in new models will please prepare the same immediately and forward them by express (pre-paid) to this office.

Our views in regard to the disagreeable twelve-inch rule of the Commissioner, will be found in another column.

The following is the list of names referred to:—

George Copeland, Seamless Bag Loom, $125
Hiller & Allen, R.R. Switch, ... $60
G. Weissenborn, Incrustation Preventer, $20
S. P. Smith, Sash Clamp, ... $20
S. Brown, Printing Press, ... $14
J. S. Addison, Gold Amalgamator, . . $8
W. M. Amadon, Crank Motion, . . . $4
W. Devine, Board Clamp, ... $3,50
S, Hill, Tile Machine, ... $3
P. Young, Sawing Machine, . . . $2,50
H. H. Olds, Propeller, ... $1,25
E. G. Otis, Elevator, ... $1,50

Memento Mori.

William P. Elliot, of Washington City,—civil engineer, architect, and patent agent, died suddenly at his residence on the afternoon of the 3rd inst., by an attack of paralysis. He had been about his usual business on the morning of that day, but before "the evening shades prevailed," he was numbered among the dead. When a young man, Mr. Elliot went to Europe, and studied architecture for some years under the ablest masters, and returned to his own country with a very high character for ability. He was the designer of the present Patent Office building, and many other architectural and engineering works around Washington. At one time he was Chief Clerk in the Patent Office, and afterwards became widely known to inventors as a solicitor of patents. In all the walks of life he maintained an excellent reputation, and has left behind him an amiable family and many friends to mourn his loss. On several occasious he contributed papers to the Scientific American. His sudden passing away from among us, at the age of forty-seven years, warns us to live daily with our accounts made up with the Great Judge.

$570 IN PRIZES.

The Publishers of the Scientific American offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

$100 will be given for the largest list,
$75 for the 2nd, $35 for the 8th,
$65 for the 3rd, $30 for the 9th,
$55 for the 4th, $25 for the 10th,
$50 for the 5th, $20 for the 11th,
$45 for the 6th, $15 for the 12th,
$40 for the 7th, $10 for the 13th,
and $5 for the 14th

The cash will be paid to the order of each successful competitor; and the name, residence, and number of subscribers sent by each will be published in the Scientific American, in the first number that issues after the 1st of January, so as to avoid mistakes.

Subscriptions can be sent at any time and from any post town. A register will be kept of the number as received, duly credited to the person sending them.

☞ See new Prospectus on the last page.

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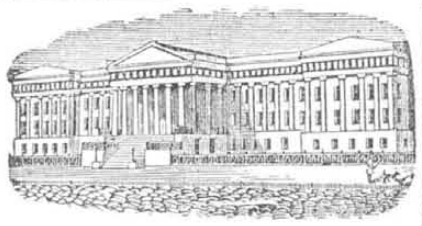

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING NOVEMBER 7, 1854.

SEWING MACHINES—D. C. Ambler, of New York City : I do not claim a shuttle whose throw is perpendicular to the general direction of the same.

But I claim, first, the method substantially as described, of sewing a felling down or zig-zag seam, by means of vibrations in a line perpendicular to the same, or nearly so, imparted either to the needle or to the cloth, substantially as described.

Second, I claim the combination with the needle having such motions, or the equivalent thereof, of a shutle thrown in the direction perpendicular or nearly so to the general direction of the seam, substantially in the manner and for the purposes specified.

Third, I claim an automatic lever for clamping the thread upon the up stroke of the needle, constructed and operating substantially in the manner and for the purposes described.

Fourth, I claim imparting to the needle a partially reciprocating rotating motion upon its own axis, substantially as setforth.

And lastly, I claim connecting two vibrating needles, each to each, substantially as set forth, whereby one vibrating mechanism serves for both needles, and said needles may also be adjusted so as to sew seams simultaneously at any required distance apart, substantially in the manner described.

LOCKS—John B. Brennan, of Mount Vernon, N. Y. : I do not claim the sliding tumblers, h, with recesses cut in them at varying points, for they are well known and in common use.

Neither do I claim a key having bits or prongs of unequal lengths, for they have been previously used.

Nor do I claim the bolt tumbler, C, with its arm, c, attached irrespective of the arm, F, on the bolt, B, and the arrangement of the sliding tumblers, h.

But I claim placing the sliding tumblers, h, between two arms, c F', one of which, F, is attached to the bolt, B, and the other arm, c, to the bolt tumbler, C, the tumblers, h, having recesses cut in them at each end, and arranged and operating in the manner and for the purposes substantially as shown and described.

MACHINERY FOR POLISHING STONE.—Ante-dated October 24, 1854 : Albert Boughton, of Malone, New York : I claim causing the stones polished to be rotated around their own axes, or the axes of their receiving framer by the polishing friction produced by the rotating polishing surface upon said stones, substantially as set forth.

TRAP FOR ANIMALS—R. S. Craig, of Cincinnati, Ohio : I claim the mechanical combination of the machinery.

I do not claim the weight or spring by which the trap may be set in motion, nor the separate springs or wheels by which it acts, by simply the mechanical combination of the machinery, as described.

JOINT IN WATER WHEELS—Reuben Daniels, of Woodstock, Vt. : I claim the peculiar construction of the joint between the rims of the shute and wheel as described.

STONE DRILLING MACHINES—Ferdinand Davison, of Petersburgh, Va. : I do not claim the invention of a clamp or catch block, constructed to move freely along the drill in its descent, but to gripe it in its ascent, as such clamps are in common use.

But I claim the peculiar device for clamping and releasing the drills or drill bars, consisting of the dog, D, to which the chain or its equivalent is attached, and the trigger, H, for locking and unlocking the same on the drill bar, said dog and trigger being constructed, combined, and arranged within the catch block, C, substantially as described, so that the latter locks the former at the termination of the descent of the catch block and unlocks it at the termination of the ascent thereof, by striking some parts of the framing of the machine or certain fixtures provided for the purpose.

GLASS FURNACES—Jacob Green, of Philadelphia, Pa. : I am aware that a blast, both hot and cold, has been introduced into the fire-chamber itself, for the purpose of aiding the combustion, but this device I regard as accompanied with serious disadvantage, as tending to force cinders and ashes up with the carbonaceous gases into the pots, thereby injuring the color and quality of the glass. I do not therefore claim this device.

But I claim the introduction of a blast of hot air among the combustible gases, after they have left the fire chamber and during their passage through an intermediate flue, so that the combustible gases and hot air may enter the furnace together well mixed, and through the presence of a sufficient supply of oxygen, effect an entire or nearly entire combustion of carbon and other combustible matter in the furnace. and consequently a great saving of fuel and better color and quality of glass.

CORN SHELLERS—Samuel Gumaer, of Aurora, Ill. : I do not claim the sectional brakes, but I claim, first, the carrying up of the ears of corn from the hopper against the brake, d, by means of the rotation of the cylinder where the larger portions of the ears are first reduced preparatory to their being finally divested of the grains, as described.

MANUFACTURE OF BUCKLES—S. S. Hartshorn, of Orange, Conn. : I am aware that the frame or bow of the buckle has been made of one piece, and the ends secured together by bosses or bulbs on the ends, and the socket part of the tongue made to fit them, as made by P. P. R. Haydon ; and also by dovetailing the ends together, and securing the dovetailed ends by the socket part of the tongue, as made by Wm. Shove, neither of which is used by me in the manufacture of my buckle ; I therefore do not claim either of them as my invention, but distinctly disclaim them.

I claim the manufacture of a buckle of three parts by dies or swedges, in such manner that the two ends of the wire of the main frame shall be secured by the socket of the tongue part, while the other part will have a free independent motion, when the whole is constructed and fitted for use, substantially as described.

GLASS FURNACES—A. K. Hay, of Winslow, N. J. : I do not claim a central fire pot in glass furnaces ; but I claim the trench around the same, and between it and the seiges, for the purposes set forth.

BARREL MACHINERY—H.S.Higgins, of Graham, Ind.: I do not claim any of the tools separately considered ; but I claim the combination of the shaft with the sectional expanding cutter rim, constructed, arranged, and operating substantially as set forth.

BOTTLE STOPPERS—Thos. Kendall, of San Francisco, Cal.: I claim the constructing of bottles, jugs, or jars, with a tri-threaded screw in the neck of each for the purpose of holding safely the cork or stopper thereof, and the convenience of inserting or withdrawing the same, the threads of the said screw having the peculiar form and beveled surface indicated by the form of the core on which said bottle necks are to be formed, and which is described.

FURNACES FOR HEATING BUILDINGS—Joseph Leeds, of Philadelphia, Pa. : I claim, in combination with the chamber above the fire box, the deflector, L, and frustum, N, with the exit pipe, M, passing through it, for the purpose of regulating the draught, and throwing it from the center towards the sides of the burning mass, and thus produce equable combustion, substantially as described.

VULCANIZING ELASTIC GUMS—E. E. Marcy, of New York City : I claim the combination of selenium with india rubber as a curing or vulcanizing agent.

COAL HODS—W. N. Martin, of Bristol, R. I. , I disclaim the invention of the common coal hod.

I claim separating the main central chamber of a coal hod, or bucket, from the outer sides and bottom of the same by an interior lining of short metal partially perforated or of sheet metal and wire grating combined, in such a manner as to form a dust chamber between said lining and the exterior of the hod, or bucket, open at the seat and closed in front, by which the coal only will be discharged at the front side of the bucket, and the dust be deposited in the said dust chamber, and when the coal is all discharged from the bucket, the dust can be removed from its receptacle therein, by movements the reverse of those required in discharging the coal from its receptacle, substantially as set forth.

POTATO DIGGERS—I. W. McGaffey, of Philadelphia, Pa. : I claim arranging two endless chains of elevators, I J, on drums, which have their axes standing at right angles, or nearly so, to the screen and digger, and having the elevators of one of said chains come opposite the spaces between the elevators of the other chain, substantially as described.

SAWING BOLTS FOR STAVES—Barnet McKeage, of Accatuik, Va. : I claim the improved form of the segments from which blocks for staves are to be cut, to wit, the sides of said segments being tangential to a circle around and concentric with the heart of the log from which said segments are formed, substantially as set forth.

BOMBS, SHELLS, OR GRENADES—E. T. Miller, of Boston, Mass. : I claim the combination of the barrels, a, and chamber, A, in the manner and for the purposes set forth and constructed substantially as described.

MANUFACTURING LEATHER BANDING FOR MACHINERY—George Miller, of Providence, R. I. : I claim my improved manufacture of round banding as made, substantially as described, that is to say, by reducing a strip of leather or other suitable material to the shape denoted in fig. 1, and subsequently rolling and cementing it together into that, essentially as exhibited in fig. 2, of the drawings mentioned.

SLATE FRAME—Edmund Morris, of Burlington, N. J. : I claim the mode of constructing a slate frame substantially as described.

RAILROAD CAR BRAKES—M. P. Norton, of Tinmouth, Vt. : I claim the arrangement of machinery described, by which the action of the rubber or rubbers is confined to that part of the car wheel which, as the car is moving, is forward and moving downward, and when the direction of the car is reversed, brings another rubber or set of rubbers to act upon the other side of the wheel which is then in like manner forward and moving downward.

FARM GATE—Dewey Phillips, of Shaftsbury, Vt. : I do not claim operating gates by means of rollers, as that is already known and used.

But I claim, first, the adjustable lever, L, of any desirable length and dimensions, or its equivalent.

Second, the adjustable lever, L, combined and arranged with the gate and posts, n and o, as specified, or in any other manner substantially the same which will produce the desired effect.

DESULPHURIZING GUTTA PERCHA, &c.—W. E. Rider & J. Murphy, of New York City : We claim extracting the superfluous portion of the sulphur from gutta percha, india rubber, and other vulcanizable gums or gum goods, during the heating portion of the vulcanizing process, by the use of hydrogen gas, in the apartment in which said heating process is performed, by which the after accumulation of sulphur upon the surface of said gums is prevented, and consequently the necessity of boiling them in caustic alkali entirely avoided, substantially as set forth.

CUTTING TENONS ON BLIND SLATS—E. W. Roff, of Newark, N. J. : I do not claim the disk, D, with its cutter, E, attached, for that device has been previously used.

But I claim the employment or use of the gauge, I, applied to an adjustable frame, H, and arranged in the manner and for the purpose set forth.

STEAM ENGINE VALVES—Chas. Rumley, of Rochester, N. Y. : I claim the combination of the compound valve seat, consisting of an adjustable and a self adjusting segment, with a rotating wing valve revolving isochronally with the piston, substantially as set forth.

ROTARY ENGINES—Chas. Rumley, of Rochester, N. Y. : I am aware that the cylinders of rotary engines have been made of an elliptical form to adapt them to revolving pistons of varying radius, such as I employ ; therefore I claim neither the piston of varying radius, nor the elliptical cylinder ; all I claim is making the internal curvature of such a cylinder, for such a purpose, to coincide with those portions of the lines of two or three intersecting circles of equal radius and described from centers, occupying the relative positions described, which are exterior to the points of intersection whereby the construction of an elliptical cylinder is greatly simplified, so that it may be bored with precision with an ordinary boring engine, as described.

MACHINERY FOR MAKING HAT BODIES—Isaac Searles, of Newark, N. J. : I do not claim these devices when used as heretofore and for the purposes for which they may have been used, but when used in the manner and for the purposes set forth.

I claim, first, the brush-feeding roll in combination with the metallic bar, as described.

Second, I claim the use of two or more pickers when used to throw the fur on all sides of one and the same cone or wire gauze, for the purpose of laying the fibers of fur in all directions without depending on the rotary motion of the cone to equalize the thickness.

HARNESS SADDLES—R. M. Selleck, of New York City : I am aware that wood trees, by considerable care and labor, can be made of any desired shape, and were it not for the labor and time required to construct them, and the liability of their breaking when made small and symmetrical they would be used in preference to metal trees on account of their being light.

I claim the depressions, B B, formed on each side of the head of the cast-iron saddle-tree, in combination with the gullet-piece, G, the tongue of said gullet piece serving as a tack hold, substantially as and for the purposes described.

Second, providing the flaps with tongues which pass under the lower parts of the frame, while the flaps pass on the top of the same, substantially as described.

Third, making the false seat of tin, and separate from the cantel, substantially as set forth.

FORM FOR AND MODE OF OPERATING CIRCULAR SAWS—James Slater, of Macon, Ga. : I claim cutting out portions of the edge of the saw, at points opposite to one another and arranging it in such relation to the crank pin that its teeth will not come in contact with the board or log, while the said crank pin is on either of the dead centers, substantially as described.

CORN SHELLERS—J. P. Smith, of Hummelstown. Pa. : I do not claim to be the inventor of a concave cylinder, as the same has been in use before ; nor the coiled spring, o o, and guide, n n.

But I claim, first, the jointed shelling bars, having rests, and springs, in combination with the coiled spring and guides.

Second, I also claim the vibrating feeder operating substantially as set forth.

DIRECTING THE BLAST IN FURNACES—D. H. Washington, of Hannibal, Mo. : I do not claim the inner cone, D, separately, for that or its equivalent has been previously used.

But I claim the employment or use of the two hollow cones or funnel s D E, for the purpose shown, said cones or funnels being applied as described, or in any other way to produce the desired effect.

MACHINE FOR HEAD PART OF SHOVEL HANDLES—Elbridge Webber, of Gardiner, Me. : I claim the longitudinal and latteral moving cutters, operating simultaneously on opposite sides of the handle in combination with the cams moving the carriages, and the rotary support of the handle constructed, arranged. and operating substantially as set forth for the purpose specified.

LOCKS—Chas. Wilson, of Springfield, Mass.. I claim the combinatian of series of opposite tumblers attached to and moving with the bolt substantially in the manner and for the purpose set forth.

FIRE ARMS—Wendell Wright, of New York City : I do not claim the cylinder, D, separately, nor either of the triggers, J K, separately, for they have been previously used.

But I claim, first, the employment or use of the thumb trigger, F, arranged and connected with the cocking trigger, K, substantially as shown, so that the trigger, F, may be operated by the thumb, while the trigger, K, is operated by the hand.

Second, I claim countersinking the end of the stop, M, which locks or retains the cylinder, D, as each chamber is fired for the purpose of enabling said stop to enter the chambers when the cartridge or powder and balls are within them.

Third, I claim the flexible pin, l, at the end of the hammer, F, whereby the pin is enabled to adjust itself to the vents, c, of the chambers, b, and thus insure the ignition of the pills, as set forth.

Fourth, I claim the nipple boss, E, at the side of the cylinder, D, when said boss is inserted within a cavity. f, in the cheek piece, and encompassed by a fire ring, g, for the purpose of preventing the explosion of more than a single chamber at once, or at one operation of the trigger, K.

LOOM BEAMS—S. T. Thomas, and Eliza Ann Everett, adminx. of Edw. Everett, dec., of Lawrence, Mass. : What is claimed is forming the loom beam of sectional parts or beams, which, when arranged side by side on a shaft form the entire loom beam ready for insertion in the loom, by which arrangement the length of the loom beam may be varied and a variety in the stripes produced by simply varying the relative positions of the sectional loom beams in the looms, as set forth.

CARRIAGE LIFTING JACKS—John Jenkins, of Monroe, N. Y. (assignor to Roe, Horton & Co., of Chester, N. Y.) : I do not claim a bar having teeth only on its back side, in combination with an adjustable fulcrum link, notched pawl, and lever.

But I claim the arrangement of the axle rest or seat, H, substantially as described.

STONE DRESSING MACHINES—John P. Avery (assignor to J. B. Bromley,) of Norwich, Conn. : I do not claim as new, in cutting stone, the mere arrangement of rotating cutters affixed radially to a revolving face plate, as such has before been used in stone boring machines.

But I claim the combination and arrangement specified, with the revolving face plate, or its equivalent, of the rotating taper or conical picks or cutters, g, operating throughout their length on the stone to face it, with a velocity or movement on their axis, proportioned to the varied velocity given them by the revolving face plate, which carries and drives them, substantially as specified, and whereby the advantages set forth are obtained.

DESIGNS.

BAR ROOM STOVES—Jacob Beesley, (assignor to Wm. P. Cresson & Co.,) of Philadelphia, Pa.. Ante-dated May 7, 1854.

EGG STOVE—David Stuart, (assignor to W. P. Cresson,) of Philadelphia, Pa.

[NOTE—Inventors are still active and persevering, even amidst the general depression of business. They have now more time to think, and develope good improvements. Nine of the patents in the above list were secured through the agency of Munn & Co.

[Correspondence of the Scientific American.]

Wine Making in France—Failure of the Grape Crop.

The following interesting letter from one of our correspondents in France, conveys, we presume, the "very latest intelligence" from the wine regions of that country, It will be seen that the grape crop this year has failed :

"EPERNAY, France, Oct. 14, 1854.

I left Paris three or four days ago, and have since been engaged in looking at wine caves, the gathering of grapes, making of champagne, etc.

Epernay is quite a large village, situated 120 miles east of Paris, on the Paris and Strasburg Railway, at its junction with the one from Rheims. It is the capital of the wine districts of France, and from here comes the best qualities of "Champagne" that we have at home.

They have just commenced pressing what little they have to make this year, and it was this process that I came principally to see.

To gather the grapes they usually send out a gang of women, with an overseer, and as the land is divided into strips of grape vines, they take one strip at a time, and take it clean. They cut the bunches off with knives, crooked for the purpose, and put them in a basket on their arm, after which they empty them into larger baskets containing 100 pounds, to put on the backs of donkeys. The animals are so well trained that they will go from the field to the wine press, and suffer the load to be taken off, and return alone. After a sufficient number of grapes have been gathered they put them in the press. The liquid has a red color at first, but after the sediment settles and it has been drawn off into casks two or three times, it becomes lighter. It is then put into bottles, corked, and left bottom upwards for a month or two, at the end of which time all the sediment in the bottle has descended to the cork. The bottle is then opened, and with the cork comes the dirt. A new cork is then put in. The wine is now of that light, clear color peculiar to "Champagne" and is ready for sale. It is kept in caves 50 to 100 feet below the ground.

The wine caves here at Epernay, and one I saw at Chalons, are immense. I saw in them Champagne in solid piles of four feet high and one hundred feet square. In the one I saw this morning, there was a railway throughout, connecting with that to Paris. It was over six miles long, about seventy feet below ground, and the sides were filled with wine. You can buy good Champagne here for fifty cents a bottle.

The grape crop has proved almost a total failure, this year, throughout the country.

W. Y. B.

Superior American Clocks.

The fame of American common clocks is world-wide, as they chime the hours to the Englishman on the banks of the Thames, and the Chinaman on the shores of the Yellow Sea. This has been so for nearly a quarter of a century, because New England could make neater and cheaper clocks than all the world beside. Foreign clock makers, however, comforted themselves with the idea that however cheap we could make clocks, we were unable to make those of the first quality —accurate time-keepers—and in this opinion they were rooted and grounded because we had to send to England for turret and other clocks of the *highest* character and *best* quality. But there is no necessity for doing this any longer, because as good clocks for keeping accurate time in church, hall, office, and mansion, are now manufactured by Messrs. Sherry & Byram, Sag Harbor, L. I., as can be obtained any where, either in England, Germany, Switzerland, or France.

We have used one of their clocks in our office during the past year, and can speak understandingly of its operative qualities. It is made with an improved compensating pendulum, and is a most accurate time-keeper. Messrs. Sherry & Byram have provided turret clocks for a number of churches, in various parts of our country, all of which, we understand, have given entire satisfaction. It always affords us pleasure to hear and know of improvements made in the mechanic arts by any of our countrymen.

(For the Scientific American.)

Destroying Canada Thistles.

I noticed in a recent number of the SCIENTIFIC AMERICAN a short article taken from the *Germantown Telegraph*, which treats of destroying the Canada Thistle by repeated plowing, and then seeding down with clover. This mode of treating the thistle may do in some soils, but here in Lancaster County it will not accomplish that object, at least my experience with it has been entirely different.

I have been induced, from various statements which I have seen at different times concerning the different modes of destroying this detestable weed, to give to your numerous readers some facts which may prove of advantage to some of them—as the readers of your paper are not confined to the mechanical branches alone, but are men of almost every profession, from the most scientific mechanic down to the tiller of the earth. I had a patch of the Canada thistle of from four to five rods square, in a meadow field, but it proved to be quite an extensive job to get rid of it. The regular course of farming only improved its growth ; there had been an attempt made to dig it out by digging from two to three feet deep, then carefully removing the roots, but this seemed only preparing the ground for its more luxuriant growth afterwards, as it grew taller and thicker than ever. We were careful to keep it mowed down so as not to sow the seed to form ; and, finally, I concluded to give it a heavy coat of salt, which was sowed over it about the first of July, 1850, giving it the appearance of a coat of snow. There being an abundance of rain shortly afterwards it dissolved the salt, and to all appearance killed the thistle, and I found on digging down that the roots were completely destroyed for about ten inches below the surface. But what was my surprise when I found it, in a short time, coming right up again, with its green top protruding above the surface. I was ready then to conclude it was a hopeless undertaking to destroy it. The following spring it came up as usual, but soon began to present a yellow and sickly appearance, and did not grow to more than half its usual hight, and ever since then it has continued to dwindle away, until now there is not twenty stocks to be found. I have also found that by applying strong salt pickle to some bunches to which I had not applied the dry salt, that it effectually destroyed them at once, and I am now fully convinced that to cut them close to the surface, and apply strong pickle, without further trouble they will be destroyed.

S. L. DENNEY.

Lancaster, Pa.

The Scientific American.

This is the *very best* paper now published in the world. It is so, because it may be relied on with the most perfect certainty, as the information which it gives upon machinery, inventions, discoveries, &c., are the result of actual experiments and investigations of a corps of the most efficient and experienced artists and mechanics. It is a text book that every man who has even a taste for machinery, &c., should have in his house.—[Journal, Pass Christian, Miss.

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TO CORRESPONDENTS.

G. M., Jr., of Ill.—Your improvement in marking plates is patentable. We have doubts as to its successful operation. You do not state whether you have made a trial.

J. B., of Del.—Cannot send you the *People's Journal* for Sept.—all gone. A left-hand thread cannot be cut with a right-hand pair of dies.

W. P. F., of Va.—We like the horizontal better than the vertical boiler, on more accounts than one.

D. H., of Md.—Your alleged improvement in operating cross-cut saws does not possess any point of novelty upon which a patent can be secured. We had in our possession two years ago a model of an apparatus embracing the same features. No chance.

J. W. G., of Md.—Your letter is received and is very satisfactory. You are very considerate in explaining the matter.

G. S. W., of Washington, D. C.—We do not think there is any chance for you to secure a patent on the funnel improvement. We have seen them constructed in essentially the same manner. Accept our thanks for the expression of your confidence in us.

A. D., of Mich.—The mode of action described by you, of the steam through a tube is of no value whatever for propelling machinery; it is simply the same as that of water on the re-action wheel.

J. C. H., of N. Y.—Your improvement in pumps operates on the same principle as the endless chain pump so commonly used. There is not the slightest chance for a parent on it.

J. B. T., of Pa.—Your improved device for adjusting the weight of an ox cart, so as to render the load more easy of draught under different conditions, appears to be a good thing. Send on the proposed sketch and description for further examination.

J. E. H., of Texas—We do not think you can apply a surface condenser successfully, on a small steamboat of light draught for canal navigation. A screw propeller with the blades partly out of the water might answer your purpose, with a draft of three feet, but not well with only eighteen inches draught.

E. T. S., of ——.—By using a blower to force the air through the fire (as we understand you) will produce a more rapid combustion, cause greater heat, and consume more fuel. Steam heat is the safest for you to employ, but you are right in supposing it more healthy to heat the factory with hot air pipes, than to send the heated air into the factory. The only objection that we can urge to your plan is the danger of having over-heated pipes by which your factory might be liable to take fire.

A. W. H., of Mo.—Your article on painting will be acceptable, and do good to the community.

W. C. D., of Fla.—We are obliged for your communication, and will give it a place next week.

T. R. C., of Mo.—Your combined propeller is new, but we do not see how any advantage could be obtained from its use.

W. S. R. of Pa.—You ask if we consider you a foreigner because you live in Pennsylvania. You are so far as the Canadian Government is concerned, as much so as a Canadian or an Irishman is in regard to ours, before naturalization. Mr. R. has no patent in Canada, and there is at present no way for him to obtain one unless he goes there and becomes a subject.

J. M., of Mass.—We are acquainted with no work upon the manufacture of boots and shoes, and presume none has been published. There are a great variety of roofing. The requisites you speak of are desirable.

A. B. C., of Mass.—If A describes an invention to B sufficiently clear so as to enable him to understand it, B cannot, without violating his honor and conscience, swear that he is the inventor.

W. T. of Ill. We would advise you to construct the model at home—it can be done cheaper than here.

M. O'R., of Mo.—We doubt very much about your being able to procure a fountain pen which is capable of operating satisfactory. We do not think they are kept in the market for sale.

J. P., of N. C.—Your improvement in molding is new, and we think a patent can be secured for it. Send us a model.

W. A. P., of Miss.—If your caveat describes the same thing as Mr. S. claims, you need not apprehend any difficulty. The prior inventor is entitled to the patent. Send on the model as soon as possible.

T. P., of N. Y.—Yours is received, and the application transmitted to the Imperial Commission. You will hear from us again about the matter.

P. C., of R. I.—Your article upon gunpowder embraces the same views and statements as are contained in a paper on this subject published in the London *Atheneum* some years since by Professor Faraday. We therefore decline publishing it.

C. C., of Mass.—We have heard of important discoveries being made and lost by accident. A celebrated engineer in Milan, several years ago, produced a metallic cement which presented all the characteristics of cast iron, without being able after that to hit again upon the same proportion. Persevere and you may succeed. How vast is the unexplored field of chemistry.

I. C., of Ohio—We tried some of your rasings but it did not do so well as we expected, perhaps it was not so carefully used as it should have been by the person who made the bread.

C. R., of Del.—When starch is exposed to a temperature of about 600 deg. it becomes a brownish color, and so far altered in its chemical characters as no longer to form a blue color with iodine. It is also soluble in cold water, and in this state it is used by calico printers.

H. H., of Ill.—You will find an illustration of the machine you refer to in No. 35, Vol. 9. You can procure this volume bound for $2,75.

O. G., of N. Y.—Your alleged substitute for a crank is on the plan of Watts' improvement for the same purpose. We tell you candidly that it is much inferior to the crank, unless it be for the very smallest class of engines. Do not waste any more time upon it.

J. T., of Ct.—The class to which your application belongs has not been taken up since your case was filed. We cannot procure the examination of a case out of its regular order—this is out of the question. We will do all we can for you in the matter.

C. F. C., of Pa.—We have carefully examined the sketch and description of your paper folding machine. The same principle of action is found in Smith's patent.

D. L., of N. J.—We do not think you can find any published account of the manner of putting up oysters for market, as it is followed in Baltimore and New Haven.

A. P., Jr., of Ky.—The double seaming machine of G. R. Moore, Sept. 1846, contains "the combination of the roller with the head," just as you show it in your sketch. There is some novelty in your arrangement, and we have no doubt a patent can be secured for it.

L. W., of Iowa.—Your application is now in the Patent Office, and cannot be altered. We think the claims as made are all that you can sustain.

M. C., of Me.—Iridium would be the best substance for you to employ. It is brittle, very infusible, and its specific gravity is about 18·6. Dr Wollaston was the discoverer.

C. C., of Pa., There is no value whatever in the ore specimen you send us for examination. We do attend to analizing metals, but in this case it is not necessary.

Money received on account of Patent Office business for the week ending Saturday, Nov. 11 :—

J. T., of Pa., $10; J. R. H., of Pa., $55; M. M., of O., $20; O. F., of O., $30; S. K., of Pa., $40; H. & C., of N. Y., $30; E. E. M., of N. Y., $10; G. W. G., of Pa., $25; J. H., & Co., of Vt., $25; O. B. J., of N. Y., $20; H. L. Y., of O., $27; A. F., of Vt., $30; H. B. Jr., of Pa., $30; N. P. Q., of N. Y., $30; G. E., of Wis., $15; L. H., of N. J., $30; H. B., of N. Y., $310; R. B. G., of N., $10; J. W., of N. Y.. $10.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 11 :—

S. & C., of Mass.; J. P., of N. J.; A. H. B., of N. Y., S. K., of Pa.; G. W. G., of Pa; H. L. Y., of O.; H. B., of N. Y.: C. & P., of N. Y.

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"It is the most economical boiler and produces more steam of a better quality than any I have ever used."—A. Low. Esq., Franklin Foundry, Albany, N. Y.

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IMPORTANT TO MANUFACTURERS OF R. R. Cars, Doors, Sash Blinds, and other wood work.—We are now fitting up largely for the manufacture of Wardwell's Patent Tenoning Machine, for which a patent was granted the 29th of August last. They will do the work of from 3 to 8 ordinary machines. They complete at one operation, even to chamfering tenons of any length, width, thickness, or style. They cut double tenons, which no other machine can do. They are substantially made, and by far more durable than any other in use. They have been in successful operation for the past 10 months. COLE, DAVIS, & CO, Lake Village N. H. For rights, address C. P. S. WARDWELL, at Lake Village. 9 3

WANTED—To take charge of the sale or introduction of certain valuable Patented Mechanical Inventions, a person who can furnish satisfactory evidence of character and ability for such business. Address, stating views as to remuneration, &c., L. P. C., Post Office, New York. 9 3*

SPECTACLES—Spy Glasses, Microscopes, Platina Points, &c., &c., &c., McALLISTER & BROTHER, 48 Chestnut street, Philadelphia. 9 4

DRAUGHT BOARDS—Patent, 23 by 29 inches.—Ready sales their best recommendation. Cheapest instruments in use. Complete for $10. Sent by Express. Direct (post paid) to CHAMBERLIN & Co., Pittsfield, Mass. 8 5t*

THE EXCLUSIVE RIGHT TO MAKE AND sell Gale's Eagle Feed Cutters. See engraving in No. 8, Vol 10 Scientific American. For cutting all kinds of fodder, particularly cornstalks by hand power, is offered for sale for the Western States, and fifteen counties in Western New York. Nourse & Co., of Boston, Mass., manufacture and sell for the balance of the United States. Retail price in Boston for best size $16. Parties wishing to buy rights can get the refusal of the territory wanted, long enough to send to Nourse & Co. to get a machine, and cut, if they choose, a hundred tuns of feed with it; by that time it is fair to presume they can form an intelligent opinion as to its value. The patent is a good one, and cannot be dodged by pirates.—Letters in reference to rights should be sent direct to WARREN GALE, No. 4 North Market st., Boston, Mass. 8 4

AMERICAN STONE DRESSING MACHINE—"Porter's Patent," illustrated in No. 8, present Volume. The subscribers are now prepared to sell rights to use the above machine, patented August 8th, 1854. One is now on exhibition at Nos. 35 and 37 Ganesvoort street, in the city of New York, and all persons interested in the business are invited to visit it, as the machine itself will give the best idea of its own capacity. Being very simple in its construction, and adapted to a great variety of purposes, requiring but little power, saving an immense amount of labor, and producing surfaces far more perfect than can be produced by hand, it is believed that no one carrying on the business of working stone, of whatever nature, can long afford to be without one.
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THE STAIR BUILDERS' GUIDE—By Cupper, now ready; price $6. By remitting, the book will be sent by mail or express to any part of Canada or the United States. W. GOWANS, 178 Fulton street. 9 4*

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7 4 FOWLERS & WELLS, 308 Broadway, N. Y.

TO EXHIBITORS—All applications for space to exhibit in the French Palace of Industry, in 1855, should be addressed to the undersigned before the 15th of November next. S. H. WALES,
Commissioner for the State of New York.
Office Scientific American, New York City.

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N. B.—Reliable orders filled for any part of the United States and Europe. 6tf

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BUFFALO MACHINERY DEPOT—Terrace St. and 36 Lloyd st., Buffalo; J. W. HOOKER, Proprietor, H. C. Brown, Superintendant, offers for sale Machinists' tools of all kinds: Engine Lathes, Planers, Drills, Chucks, Boring Mills; also machinery of all kinds on hand or furnished to order. 7tf

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1854—MICHIGAN CENTRAL R.R. LINE
D. W. WHITING, Freight Agent, and also General Forwarder, having been a practical machinist, is prepared with skill and implements to handle and ship by any line, all kinds of machinery and manufacturers' wares. Mark plainly, care D. W. WHITING, Buffalo, N. Y. 7tf

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STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 1 tf

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NEW HAVEN MANUFACTURING COMPANY Machinists' Tools. Iron planers and Engine Lathes of all sizes. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Chucks, &c., on hand and being built by the quantity, which enables us to sell low. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 1 tf

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A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

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CHARLES W. COPELAND,
1 tf Consulting Engineer, 64 Broadway.

THE MERIDEN MACHINE CO.—Successors to Oliver Snow & Co., West Meriden, Conn. Have on hand and make to order a great variety of Lathes, Planers, and other machinists tools of superior quality and finish. Cuts of these tools may be had on application as above, with full particulars. They also manufacture Farnam's Patent Lift and Force Pumps of all sizes. For mines, factories, railroad stations, &c. Having a large and extensive variety of patterns, the accumulation of over 20 years business, and extensive facilities for making light or heavy castings, are prepared to contract for any kind of mill work, mining machinery, &c. New York Office and Sample Room, No. 15 Gold, cor. Platt st. 1 3m*

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NORTHVILLE MACHINE WORKS—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass., August 9, 1854. TAFT & GLEASON. 50 1y*

NORCROSS' ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.

Rights to use N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.

The printed report of the case with the opinion of the Court can be had of Mr. Norcross, at Lowell, or 27 State street, Boston. 36 6m*

MACHINISTS TOOLS—SHRIVER & BROS., Cumberland, Md., (on B. and O. Railroad, midway between Baltimore and the Ohio River,) manufacturers of Lathes, Iron Planers, Drills and other machinists tools 50 6m*

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Science and Art.

Man and Monkey.

About three years ago, we recollect that a paper was read before the Academy of Sciences, in Paris, respecting a race of men in Africa, whose vertebra protruded so much as to form a respectacle tail; they could speak, and were in other respects real men. From a number of the Paris correspondents of our daily papers, it appears that a book has lately been published in Paris respecting this wonderful class of men, presenting testimony in favor of their existence. It appears to us that if such a race of men existed, it would be very easy to remove all sceptism on the subject by producing some of the identical individuals. Until this is done, the sceptics have greatly the advantage of the credulous in asking for substantial evidence to remove their doubts. It was the opinion of old Lord Montboddo that man was but a developement of the monkey, and there are many in our own day who believe in this same developement theory, but Prof. Owen, the most eminent of naturalists, entertains totally different views. In a recent lecture delivered at Liverpool on the human races, he said, "the unity of the human species is demonstrated by the constancy of these osteological and dental characters to which the attention is more particularly directed in the investigation of the corresponding characters in the higher *quadrumana*. Man is the sole species of his genus, the sole representative of his order. He has no nearer physical relations with the brute kind than those which arise out of the characters that link together the great group of placental mammalia, called "unguiculata." The Professor briefly recounted the facts at present satisfactorily ascertained respecting the antiquity of the *quadrumana* and of man upon the surface of the earth. At the time of the demise of Cuvier, in 1852, no evidence had been obtained of fossil *quadrumana*, and the Baron supposed that both these and the *bimana* were of very recent introduction. Soon after, evidence with regard to the fossil *quadrumana* was obtained from different quarters. In the eldest (eocene) tertiary deposites in Suffolk specimens of jaws and teeth were found which unerringly indicated the former existence of a species of monkey of the genus *Macacus, (Macacus eocenus.)* About the same time the tertiary deposites from the Himalaya mountains gave further evidence of the *quadrumana*; jaws, and some other parts of the skeleton having been found completely petrified. Human bones have been found in doubtful positions, geologically considered, such as deserted mines and caves, in the dedritus at the bottom of the cliffs, but never in tranquil undisturbed deposits, participating in the mineral characters of the undoubted fossils of these deposits. The petrified negro skeletons in the calcareous concretes of Guadaloupe, are of a comparatively recent origin. Thus, therefore, concluded the Professor, in reference both to the unity of the human species, and to the fact of man being the latest, as he is the highest of all animal forms upon our planet, the interpretations of God's works coincide with what has been revealed to us as to our own origin and zoological relations in this world.

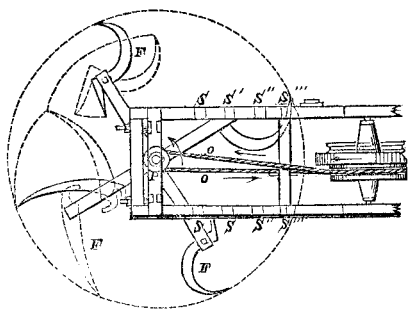
Of the nature of the creative acts by which the successive races of animals were called into being we are ignorant, but this we know, that, as the evidence of unity of plan testifies to the oneness of the Creator, so the modifications of the plan for different modes of existence illustrate the benificence of the designer."

The Narcotics and Poisons we Indulge in.

The *Chemistry of Common Life* states that tobacco is produced to the extent 4,480,000,000 lbs. annually, and is used among 800,000,000 of men; Opium, among 400,000,000 of men; Indian Hemp, among 250,000 of men; Betel-Nut, (or Pinang,) among 100,000,000 of men; Cocoa, among 10,000,000 of men. Little is known in Europeof the use of hemp as a narcotic; yet in the East it is as familiar to the voluptuary as the Opium and Tobacco of other regions. —The value of these articles is fixed at £60,500,000 annually—$302,500,000.

History of Reaping Machines.—No. 8.

FIG. 26.

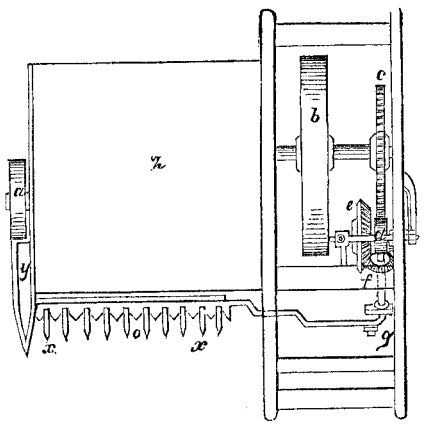


In our continuation of the history of foreign reaping machines, we find after Bell a patent was granted on the 31st of August, 1830, to Edward Budding, of Thrupp, Eng., for a small hand machine, for reaping lawns and grass plots. It was something like a barrow, the wheel which rolled on the ground had teeth on its inner face, which geared into a bevel pinion, gearing into another on the end of a rotating shaft in front, on which was a cylinder for a set of helical cutters like those on a cloth shearing machine, or Hovey's straw cutter, and below which was a stationary sharp transverse blade. When this machine was moved forward, the helical cutting cylinder cut the grass between the sharp blade below and the rotating cutters. By this machine any person not acquainted with the use of the scythe, could crop lawns with great precision, but it performed its work slowly.

In the *Quarterly Journal of Agriculture*, Vol. 3, p. 185, there is a brief notice of a Russian reaping machine, invented by M. P. Hauy, of Odessa, in 1831. It merely states that by the aid of two horses, a man and two boys, a field of grain, of about ten acres could be reaped in a day.

In 1839 a patent was granted to one Henry Springer, of Vienna, Austria, for the reaping machine illustrated by figure 26, which is a top view.

FIG. 27.



This machine carries a number of horizontal reaping hooks, F, on a vertical spindle, P. This spindle, together with the knives, is put in motion by an endless band, O, which runs round a groove in a pulley attached to a carriage wheel. The whole machine then consists of two principal parts, viz., 1st. A wheel barrow, which somewhat resembles one of the ordinary kind; and 2nd. The mowing apparatus itself, which may be either permanently connected with the wheelbarrow, or arranged as to be easily detached from it. The shafts are made long so that the weight is equally balanced. The beam, S'", which is bolted to the mowing frame, together with the pulley, R, serves for keeping the endless band tense; to effect this the beam is adjustable along the slots, S S' S".

This machine could be worked by hand or horse power.

In 1845, Mr. Ridley, a Colonist in South Australia, invented a machine for reaping, thrashing, and winnowing grain, all at the same time, at the rate of nearly an acre an hour, the machine requiring to be attended by two men. The following description is given by Capt. Grey, late Governor of the Province, on page 38, of Chauncey's *Guide to South Australia.*

"It is something like a cart, pushed forward by two horses, instead of being drawn. In front of this machine is a very large steel comb, which seizes the straw of the wheat as an ordinary comb seizes hair. As the machine moves forward, the straw is, by the motion drawn through the comb, until the head is caught in the teeth and dragged upwards toward the mouth of the machine. The grain is then, as it were, combed out and falls down to the mouth of the machine; that part of the head of the wheat which does not get through, is ultimately drawn up to the same point, when it is knocked off by an apparatus like an ordinary thrashing machine, and the wheat is then thrashed wholly out, whilst the rapid advance of the machine creates a strong draught of air by which the grain is winnowed."

[The above account describes the invention of Damon A. Church, of Friendship, New York, which he patented in the United States on the 4th of May, 1841.—ED.]

From this period up to the time of the Great Exhibition in London in 1851, there were nine letters patent issued in England for reaping machines and improvements thereon.

The World's Fair was the commencement of a new era in the department of agricultural machinery—of reaping machines particularly. From the closing of the Crystal Palace in 1851, to the end of the year 1852, there were no less than twenty-eight inventions registered, and English patents granted for inventions relating solely or partially to reaping and mowing machines; few of them are of sufficient interest and present importance to demand a notice.

The annexed figure, 27, illustrates the machine known as the Tollemache Reaper, as improved by Messrs. Garret & Sons.

The machine is carried by two wheels, *a* and *b*, the latter communicating the driving power, through the wheel and pinion, *c* and *d*, to the bevel wheel and pinion, *e* and *f*, the crank, *g*, giving the rapid reciprocating motion required by the cutters, *o o*. These cutters slide within slots in the stationary teeth, *x x*, which are attached to the frame-work of the table, *z*, on which the "raker off" stands. A fender, *y*, divides the wheat as it passes along, and protects the wheel, *a*. The cutters are like the teeth of a very coarse saw, while the teeth form the support for the straw as it is cut, and insures its being severed.

This describes and illustrates a well known American reaper, as will be hereafter shown, which was patented more than twenty years ago, and from which Tollemache received the ideas which he gave to Messrs. Garrett & Sons in the construction of the above machine.

Action of Sea Water on Cements.

Two French engineers, M. M. Malaguti and Durocher, have lately devoted much attention to the action of sea water on hydraulic cements, and have discovered that "Parker's," which contains a considerable portion of the oxyd of iron, stands the best. They formed several kinds of puzzolanas by making mixtures of silica and a little lime with alumina and oxyd of iron, and then studied the action of sea-water on these mixtures, previously heated to a dull redness. After immersion for some time, these substances augmented in volume, and possessed the most remarkable characters. Each of them divided itself into two distinct compounds, one of which attached itself to the bottom of the flask, and had gained considerable cohesion and adherence; whilst the other assumed a flocculent aspect; it swelled out more and more, and rose above the bottom. In analysing these different compounds, they have found that the quantity of lime precipited is independent of the presence of alumina, whilst it is augumented by the presence of oxyd of iron. Further, they have recognized that the flocculent compound was the richest in alumina, and that the concreted deposit was richest in oxyd of iron.

These synthetical experiments having apparently demonstrated that oxyd of iron is not an incrt constituent of hydraulic cements, they believe that the presence of this oxyd would contribute to give stability to mortars and cements immersed in sea-water. It remains, however, to be ascertained whether cements or artificial hydraulic limes, formed by the addition of lime to ferruginous clays, or mixtures of clay with hydrated peroxide of iron, or even mixtures of clay and substances capable of generating oxyd of iron, will not be attacked by sea-water. But these experiments require a considerable time, and in the meantime, it may do good to give publicity to the results which they have obtained, as they may be useful to those engaged in the construction of hydraulic works, and because it is of the greatest importance that they should be verified by experience.

Life Preservers.

A sea captain, writing to the Richmond *Despatch* about the dangers of shipwreck, says: "A feather pillow has a buoyant power fully equal to half-a-dozen of the best life-preservers ever invented, and that a common mattress will make a raft amply sufficient to float a man and trunk."

[This is important, if true. All mattrasses on shipboard might be made of granulated cork, and thus be rendered trustworthy life-preservers.

LITERARY NOTICES.

LESLIE'S LADIES' GAZETTE, of the Paris and London Fashions, for November, contains an abundance of fine engravings, illustrative of the various articles of dress to be worn by the fashionable fair ones. It contains a fine wood-cut of Grisi, the famous vocalist. Frank Leslie, New York, publisher.

The PHRENOLOGICAL and WATER CURE JOURNALS, for November, published by Fowlers & Wells, this city, are good numbers.

MANUAL OF TOPOGRAPHICAL DRAWING.—This is a work by Lieut. R. S. Smith U. S. A., Assistant Professor of Drawing at West Point, and is published in a neat form by John Wiley, Broadway, this city. Topographical drawing is an art which should be more generally cultivated than it is. Those who desire to learn this art, will find that Lieut. Smith has provided for them an excellent work for self-instruction.

THE NAUTICAL MAGAZINE, for November, by Griffiths & Bates, 79 John st., contains a number of very good articles, and an excellent criticism on Liscombe's proposed improvements in modelling ships.

MECHANICS

Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

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